

Framing a Middle Byzantine Alchemical Codex

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The study of Byzantine science is at a relatively early stage, in part due to a prevailing narrative about the history of premodern science that discourages looking for scientific activity among medieval scholars writing in Greek. This narrative, developed in the nineteenth and twentieth centuries and to a certain extent still persisting,¹ recounts that the ancient Greeks, drawing on Babylonian and other Near Eastern traditions, developed a systematic approach to interpreting empirical observations, which we may call “ancient science”; such scientific activities continued into the Hellenistic and Roman imperial periods but then in late antiquity began to decline in the face of a Christian obsession with orthodoxy. At this point, just in time, the Muslim conquests of the seventh century established a new civilization that eagerly translated ancient Greek books of science and philosophy into Arabic; then, just as Islamic civilization was itself stagnating after the triumph of Sunni orthodoxy over philosophy and science in the eleventh and twelfth centuries, Western Europe discovered Arabo-Islamic science and translated the relevant texts into Latin. Latin civilization’s status as standard-bearer was confirmed around the time of the Ottoman conquest of Constantinople in 1453, when Western Europeans learned Greek, acquired Greek manuscripts, and engaged directly with the original

sources of ancient science, thus obviating the need for Arab (or Byzantine) intermediaries. This direct contact led (eventually) to the Scientific Revolution. The contribution of Byzantium, when it appears in this narrative at all, was to preserve Greek texts so that “Westerners” could discover them.²

There are numerous problems with this narrative and it has rightly been challenged on a number of fronts.³ As far as Byzantium is concerned it has persisted in practice: many modern scholars, especially non-Byzantinists, still do not expect to find Byzantines of the medieval period studying or practicing science⁴

2 For the articulation of this narrative I am indebted to Maria Mavroudi, who has summarized it most recently in *ibid.*, 33–34; see also her “Science, Byzantine,” in *The Encyclopedia of Ancient History*, ed. R. S. Bagnall et al. (2013), 6063–65; and “Occult Sciences and Society in Byzantium: Considerations for Future Research,” in *The Occult Sciences in Byzantium*, ed. P. Magdalino and M. Mavroudi (Geneva, 2006), 39–95, at 44–50.

3 E.g., G. Saliba, *Islamic Science and the Making of the European Renaissance* (Cambridge, MA, 2007), points to intellectual links between the Islamic world and Europe (such as the dependence of Copernicus’s *De Revolutionibus* on a theorem that Naṣīr al-Dīn al-Ṭūsī proved in 1260/1) in order to make a compelling argument for the continuing importance of Muslim scientists writing in Arabic after the twelfth century for scientific developments typically narrated as taking place exclusively in Western Europe.

4 Even using an unrestrictive definition of premodern science, which does not insist on nineteenth- or twentieth-century paradigms.

1 M. Mavroudi, “Translations from Greek into Latin and Arabic during the Middle Ages: Searching for the Classical Tradition,” *Speculum* 90.1 (2015): 28–59, at 30–38.

with any seriousness⁵—despite the fact that this prevailing narrative and its corollary (or premise) of an unscientific Byzantium has been challenged and can no longer be sustained.⁶ Medieval Arabic authors were clearly impressed by Byzantine technical expertise; the very few texts of Byzantine science that have been studied indicate a serious Byzantine engagement with ancient Greek and contemporary Arabic science, which also had an impact on the rest of Byzantine culture.⁷

Byzantine alchemy is one field of science that has been particularly neglected, perhaps in part because Byzantines themselves rarely professed to practice it, at least in the extant sources.⁸ The craft aspect of alchemy—metallurgy, dyeing, and tinting—was the domain not of the literary elite but of artisans.⁹ There was certainly imperial interest in such expertise, which would have been desirable in anyone overseeing the operation of the mint¹⁰ or the government monopoly

on purple cloth,¹¹ but this expertise, unlike astronomy, was not classified as philosophy. Meanwhile, the legitimacy of alchemy's theoretical or natural-philosophical side seems to have been seriously questioned, at least as much as other occult sciences. It is no wonder that despite indirect evidence for the study and copying of Greek alchemical texts throughout Byzantine history,¹² so little manuscript evidence for middle Byzantine interest in alchemy survives.¹³

While Byzantine alchemy has been little studied, there has been considerable work (relatively speaking) on the Greek alchemical corpus, the earliest and arguably most valuable witness to which is the tenth- or eleventh-century Byzantine manuscript *Marcianus graecus* 299 (hereafter, **M**), the focus of the present article. Nevertheless, work on the corpus has proceeded almost entirely with the aim of recovering texts written before and up to the fourth century CE—and, to a lesser extent, up to the seventh—rather than understanding the Byzantine engagement with the alchemical tradition to which **M** and other manuscripts bear witness.¹⁴ Greek alchemical texts and illustrations contained in **M** have been published over the past century and a half.¹⁵ In the first half of the nineteenth century, Julius Ideler

5 See Mavroudi, "Classical Tradition," 37–38.

6 See, e.g., M. Mavroudi, *A Byzantine Book on Dream Interpretation: The Oneirocriticon of Achmet and Its Arabic Sources* (Leiden, 2002); P. Magdalino, "The Byzantine Reception of Classical Astrology," in *Literacy, Education, and Manuscript Transmission in Byzantium and Beyond*, ed. C. Holmes and J. Waring (Leiden, 2002), 33–57; Magdalino and Mavroudi, *Occult Sciences*; P. Magdalino, *L'orthodoxie des astrologues: La science entre le dogme et la divination à Byzance, VII^e–XIV^e siècle* (Paris, 2006). After the publication of Mavroudi, *Achmet*, esp. chap. 10, it is no longer possible to pretend that middle Byzantine scholars had no interest in contemporary technical expertise (whether in divination or other empirical endeavors) available in Arabic. For the late Byzantine period, see M. Mavroudi, "Exchanges with Arabic Writers during the Late Byzantine Period," in *Byzantium: Faith and Power (1261–1557). Perspectives on Late Byzantine Art and Culture*, ed. S. T. Brooks (New York, 2006), 62–75. The recognition that Byzantine science should be taken seriously—and given real estate in handbooks on Byzantine thought—is reflected in A. Kaldellis and N. Siniosoglou, eds., *The Cambridge Intellectual History of Byzantium* (Cambridge, 2017), pt. 3.

7 Mavroudi, "Classical Tradition," 38–40, with references. See also her "Science, Byzantine"; and "Occult," esp. 59–92.

8 The case with alchemy is even more extreme than that of astrology, since astrology had a respectable twin that one could safely profess (astronomy) while satisfying royal and other elite demand for learned astral divination. See Magdalino, "Byzantine Reception."

9 M. K. Papathanassiou, "Metallurgy and Metalworking Techniques," in *The Economic History of Byzantium: From the Seventh through the Fifteenth Century*, ed. A. E. Laiou (hereafter, *EHB*), 3 vols., DOS 39 (Washington, DC, 2002), 1:121–27.

10 For example, see P. T. Keyser, "Greco-Roman Alchemy and Coins of Imitation Silver," *AJNum*, 2nd ser., 7–8 (1995–96): 209–34,

where it is shown that the alloys used in imitation silver coins dating from between the fifth century BCE and the fourth century CE typically correspond to recipes known from the Greek alchemical corpus and papyri.

11 For Byzantine regulation not only of murex purple but also of "imitations," see A. Muthesius, "Essential Processes, Looms, and Technical Aspects of the Production of Silk Textiles," in Laiou, *EHB*, 1:147–68, at 158–60.

12 See M. Mertens, "Graeco-Egyptian Alchemy in Byzantium," in Magdalino and Mavroudi, *Occult Sciences*, 205–30.

13 We need not conclude from this that "there was not the same vogue for alchemy in the Byzantine world as in western Europe" (A. Tihon, "Numeracy and Science," in *The Oxford Handbook of Byzantine Studies*, ed. E. Jeffreys, J. F. Haldon, and R. Cormack [New York, 2008], 803–19, at 813), especially given the considerable dependence of medieval and early modern Latin alchemy on Byzantine texts and manuscripts—manuscripts copied (and read) in "the Byzantine world."

14 See Mavroudi, "Occult," 44–50.

15 The following sketch focuses on texts contained in **M**; for a more detailed survey of scholarship on Greek alchemy, see H. D. Saffrey's "Présentation du tome 1 des alchimistes grecs par R. Halleux," in *Les alchimistes grecs*, vol. 1, *Papyrus de Leyde, Papyrus de Stockholm, Fragments de recettes*, ed. and trans. R. Halleux (hereafter, *Les alch. gr.* 1 Halleux) (Paris, 1981), vii–xv. A basic history of Greek alchemy is given by R. Halleux, "Alchemy," in *Oxford Classical*

published the *Lectures* of Stephen of Alexandria, a philosopher said to have been summoned by Heraclius (r. 610–641) to teach in Constantinople.¹⁶ Some have argued that the ascription is pseudonymous.¹⁷ Ideler

Dictionary, ed. S. Hornblower and A. Spawforth, 3rd ed. (Oxford, 1996), 52–53.

16 J. L. Ideler, ed., *Physici et medici graeci minores*, 2 vols. (Leipzig, 1841–42; repr. Amsterdam, 1963), 2:199–247. The end of *Lecture 9* is lost, and the end of what we have is at p. 247₂₃, but not realizing that there was a lacuna at this point in the middle of the word γέλεσαν, namely, after the syllable γε-, Ideler printed the end of an entirely different text as if it were the end of *Lecture 9*, on pp. 247₂₃–253; M. K. Papathanassiou, “Stephanos of Alexandria: A Famous Byzantine Scholar, Alchemist and Astrologer,” in Magdalino and Mavroudi, *Occult Sciences*, 163–203, at 170 n. 24. See also n. 162 below. Ideler’s edition did not make use of *M*, the oldest manuscript. *Lectures 1* and 2, the *Letter to Theodore*, and *Lecture 3* were collated with *M* and supplied with notes by F. Sherwood Taylor (“The Alchemical Works of Stephanos of Alexandria: Part 1,” *Ambix* 1.2 [1937]: 116–39; idem, “The Alchemical Works of Stephanos of Alexandria: Part 2,” *Ambix* 2.1 [1938]: 38–49). Maria Papathanassiou’s new edition—signaled in her “Alchemist and Astrologer,” 176 n. 46—has recently appeared: *Stephanos von Alexandria und sein alchemistisches Werk*, ed. M. Papathanassiou (Athens, 2017). For the work’s original structure, see Papathanassiou, “Alchemist and Astrologer,” 170 n. 25; eadem, “Stephanos of Alexandria: On the Structure and Date of His Alchemical Work,” *Medicina nei secoli*, n.s., 8.2 (1995): 247–66, at 251–57. Here the text will be cited and discussed according to its structure in *M* and the rest of the manuscript tradition as reflected in Ideler’s edition.

17 *ODB*, s.v. “Stephen of Alexandria,” with references. I will refer to the author of the *Lectures* as Stephen of Alexandria; for the purposes of this article the question of pseudonymity need not be answered. Wanda Wolska-Conus (“Stéphanos d’Athènes et Stéphanos d’Alexandrie: Essai d’identification et de biographie,” *REB* 47.1 [1989]: 5–89) has argued that the various Stephens (of Athens, of Alexandria, the philosopher, the sophist, and so on) attested as living and working in the late sixth and early seventh centuries are in fact one and the same person, while Papathanassiou (“Alchemist and Astrologer,” 182–84) has shown that the planetary configuration described in a passage of the alchemical lectures ascribed to Stephen of Alexandria in *M* could have been observed in Constantinople in the year 617, adding to the plausibility of identifying Stephen of Alexandria the alchemist with other Stephens (Wolska-Conus’s earliest “solidly attested date for Stephanos’s stay” in Constantinople was “619–620, mentioned in his astronomical works,” though he could have moved to the capital as early as 610, since he went “in the reign of Heraclius and the patriarchate of Sergios”: Wolska-Conus, “Stéphanos d’Athènes,” 87). Wolska-Conus leaves open the possibility that the astrological and alchemical works ascribed to him might be authentic, though she seems to incline toward the belief that these aspects of his profile are later accretions: *ibid.*, 88–89.

Mossman Roueché (“Stephanus the Philosopher and Ps. Elias: A Case of Mistaken Identity,” *BMGS* 36.2 [2012]: 120–38; and “Stephanus the Alexandrian Philosopher, the *Kanon* and a

also published three of four iambic alchemical poems.¹⁸ The remaining texts (along with texts not in *M* but in later manuscripts) were published in 1888 by the French chemist and politician Marcellin Berthelot (1827–1907) and the philologist Charles-Émile Ruelle, whom Berthelot enlisted to aid him in his endeavor to uncover the early history of chemical recipes.¹⁹ This imperfect edition (with French translation) is still the only published edition of many Greek alchemical texts.²⁰

Seventh-Century Millennium,” *JWarb* 74 [2011]: 1–30) has challenged the ascription of various works to Stephen of Alexandria. When it comes to the alchemical *Lectures*, Roueché tends to assume rather than prove that the ascription of alchemical works to Stephen of Alexandria is pseudonymous. More cautiously, Jean Lempire (“D’Alexandrie à Constantinople: Le commentaire astronomique de Stéphanos,” *Byzantion* 81 [2011]: 241–66, esp. 262–64) suggests that the alchemical works are written in a rhetorical style quite distinct from the style of Stephen’s commentaries. For Lempire’s compelling response to Roueché concerning the commentary on Ptolemy’s *Handy Tables* ascribed to Stephen, see *Le commentaire astronomique aux Tables faciles de Ptolémée attribué à Stéphanos d’Alexandrie*, ed. and trans. J. Lempire, *Corpus des Astronomes Byzantins* 11 (Louvain, 2016–), 1:4–6 (introduction).

18 Ideler, *Physici et medici*, 2:328–52: poems 2–4; the first poem had already been published previously. An English translation of poem 2 appeared in 1920: C. A. Browne, “The Poem of the Philosopher Theophrastus upon the Sacred Art: A Metrical Translation with Comments upon the History of Alchemy,” *The Scientific Monthly* 11 (September 1920): 193–214. An edition of all four poems with critical apparatus, including readings from *M*, was published three years later: *Heliodori carmina quattuor ad fidem codicis casselani*, ed. G. Goldschmidt, *Religionsgeschichtliche Versuche und Vorarbeiten* 19.2.1 [1] (Giessen, 1923). An English translation of poem 4 (Archelaos) appeared in two parts by C. A. Browne, “Rhetorical and Religious Aspects of Greek Alchemy,” *Ambix* 2.3–4 (1946): 129–37; and 3.1–2 (1948): 15–25. Browne argued on the basis of meter and content that the four poems were composed by a single author.

19 *Collection des anciens alchimistes grecs*, ed. and trans. M. Berthelot and C.-É. Ruelle, 3 vols. (Paris, 1887–88) (hereafter, *CAAG*). Diagrams from *M*: *ibid.*, 1:132, 138–41, 143, 146, 148. Berthelot and Ruelle drew these texts from several of the most important manuscripts of the Greek alchemical corpus, including *M*. Berthelot also inaugurated the comparative study of Greek, Syriac, and Arabic alchemy with his three-volume *La chimie au Moyen Âge* (Paris, 1893): Greek (vol. 1), Syriac (vol. 2, with Rubens Duval) and Arabic (vol. 3, with O. Houdas).

20 For a discussion of the edition’s shortcomings, see Zosimos of Panopolis, *Zosime de Panopolis: Mémoires authentiques*, ed. and trans. M. Mertens, vol. 4.1 of *Les alchimistes grecs* (hereafter, *Les alch. gr.* 4.1 Mertens) (Paris, 1995), cvi–cix. Its gravest weakness for the present purposes is the order in which it presents the texts, which does not reflect any of the manuscripts. As Mertens remarks (p. cviii), “this edition nevertheless has the great merit of existing.”

Its publication was only a beginning, since a basic understanding of the manuscript tradition and how the texts of the alchemical corpus fit together was still lacking. Taking its inspiration from a detailed catalogue of astrological manuscripts begun in 1898,²¹ a new project organized by Joseph Bidez began to catalogue, describe, and study Greek alchemical manuscripts in order to understand the place of the alchemical corpus in “the history of religious and philosophical ideas”; the first volume appeared in 1924.²² Although works of Byzantine alchemy were published in these volumes, interest in Greek alchemy continued to focus on earlier periods. The project of editing was interrupted in the middle of the twentieth century, but a new venture in editing Greek alchemical texts began in 1981 with the series *Les alchimistes grecs*.²³ It was in this series that Michèle Mertens published an edition of some of the works of Zosimos of Panopolis (third/fourth century, possibly ca. 300 CE).²⁴ More recently, the alchemical work ascribed to Democritus and the commentaries on it have been edited by Matteo Martelli.²⁵

In all these endeavors scholars have depended on Byzantine manuscripts to retrieve ancient alchemy, but there has been little inquiry into why Byzantines copied these texts, how they engaged with them, or what impact this engagement had on Byzantine culture.²⁶

Compounding this is the fact that research into many aspects of middle Byzantine culture and intellectual life—and how this intellectual life was affected by the period’s momentous political, social, and economic changes—is in early stages. Work on middle Byzantine philosophy and science has typically focused on several major figures, such as Psellos and his students, especially John Italos (d. after 1082). These men have been seen as revivers of ancient philosophy and even the first true Byzantine philosophers since late antiquity,²⁷ but the question of what philosophy was and was perceived to be in Byzantium is a complex one.²⁸ Intellectual activity in Byzantium was not neatly sectioned off into “secular” and “religious” or “philosophical” and “theological” (nor was it in ancient Greece for that matter). Although there were many Byzantine definitions of *philosophia*, including monastic asceticism, at least some notions of what philosophy is were shared among elite Byzantines, whether they spent their days in monasteries, aristocratic homes, the Patriarchate, or the imperial palace. For example, a text in the alchemical corpus assembled in *M* alludes to the longstanding and influential Byzantine definition of *philosophia* as *ὁμοίωσις θεῷ κατὰ τὸ δυνατόν*, “the assimilation to God as much as possible,”²⁹ a basic assumption

21 F. Cumont et al., eds., *Catalogus codicum astrologorum graecorum* (Brussels, 1898–1953).

22 *Catalogue des manuscrits alchimiques grecs*, 8 vols. (Brussels, 1924–1932) (hereafter, *CMAG*), organized by the country in which each manuscript currently resides. For Bidez’s description of the project’s inspiration and purpose, see i:iii–iv: “pour éclairer l’histoire des idées religieuses et philosophiques.”

23 Saffrey, “Présentation,” in *Les alch. gr.* 1 Halleux, xiv–xv.

24 *Les alch. gr.* 4.1 Mertens; for the date, see *ibid.*, xv–xvii.

25 Ps.-Democritus, *Scritti alchemici: Con il commentario di Sinesio*, ed. and trans. M. Martelli (Paris and Milan, 2011) (hereafter, ps.-Dem. Martelli). For criticism of some aspects of this edition, see the review by A. Colinet, *Byzantion* 83 (2013): 434–40. Martelli has published a revised version of this edition, accompanied by an English translation: *The Four Books of Pseudo-Democritus*, ed. and trans. M. Martelli, Ambix 60, Suppl. 1 (Leeds, 2013) (hereafter, ps.-Dem. Martelli Engl.); the Greek text in this version is mostly the same (though with several unspecified corrections, *ibid.*, vi–vii). This version also includes the new publication of the Syriac pseudo-Democritus (including passages not found in the extant Greek tradition) as well as a 1606 Latin translation by Matthaeus Zuber from Vienna, ÖNB, lat. 11427.

26 Notable exceptions include Mavroudi, *Achmet*, 107, 400–403; P. Magdalino and M. Mavroudi, “Introduction,” in *idem*, *Occult*

Sciences, 18; Mertens, “Graeco-Egyptian Alchemy”; Papatthanassiou, “Alchemist and Astrologer”; G. Merianos and S. Sakorrafou, “Μαρτυρίες περί αλχημείας στο Βυζάντιο σε μη αλχημικά κείμενα,” in *Επιστήμη και τεχνολογία. Ιστορικές και ιστοριογραφικές μελέτες*, ed. E. Mergoupis-Sabaidou et al., Hetaireia Meletēs kai Diadosēs tēs Historias tōn Epistēmōn kai tēs Technologias 1 (Athens, 2013), 45–65; and now G. Merianos, “Alchemy,” in Kaldellis and Siniosoglou, *Cambridge Intellectual History of Byzantium*, 234–51; C. Viano, “Byzantine Alchemy, or the Era of Systematization,” in *The Oxford Handbook of Science and Medicine in the Classical World*, ed. P. T. Keyser and J. Scarborough (New York, 2018).

27 B. Tatakis, *La philosophie byzantine*, 2nd ed. (Paris, 1959), 139.

28 For an overview of the problem, see G. Podskalsky, *Theologie und Philosophie in Byzanz* (Munich, 1977), 16–34; K. Ierodiakonou, ed., *Byzantine Philosophy and Its Ancient Sources* (New York, 2002); K. Ierodiakonou, “Byzantine Philosophy Revisited (A Decade After),” in *The Many Faces of Byzantine Philosophy*, ed. B. Bydén and K. Ierodiakonou ([Bergen], 2012), 1–21; and M. Mavroudi, “Learned Women of Byzantium and the Surviving Record,” in *Byzantine Religious Culture: Studies in Honor of Alice-Mary Talbot*, ed. D. Sullivan, E. Fisher, and S. Papaioannou (Leiden, 2012), 53–84, esp. 54.

29 See K. Ierodiakonou and D. O’Meara, “Philosophies,” in Jeffreys, Haldon, and Cormack, *Oxford Handbook of Byzantine Studies*, 711–20, at 712.

to which the reader will undoubtedly assent: “For what is philosophy but assimilation to God as much as possible for a human being?”³⁰ This definition, from Plato’s *Theaetetus* (176b1), was prominent in late antique thought, from the emperor Julian to Gregory of Nyssa,³¹ Proclus,³² and John of Damascus.³³ In the middle Byzantine period Michael Attaleiates could allude to it in addressing the emperor Nikephoros III Botaneiates (r. 1078–1081), confident that his audience would immediately recognize the philosophical resonance of his praise: “You have made it your most zealous endeavor to be as similar to the God who crowned you as is possible for a human being.”³⁴ The fact that an eleventh-century Byzantine reader could encounter this notion in the Cappadocian Fathers, John of Damascus, the alchemical corpus, and an encomiastic preface to a work of contemporary history (among other texts) indicates the extent to which these texts and their readers all shared a conceptual universe.³⁵

30 Stephen of Alexandria, *Lecture 6*: M 2.4^r 21–22; Ideler, *Physici et medici*, 2:224^{27–28}: τί γάρ ἐστιν φιλοσοφία, ἀλλ’ ἡ ὁμοίωσις Θεῷ κατὰ τὸ δυνατόν ἀνθρώπῳ. Cited by C. Viano, “Les alchimistes gréco-alexandrins et le *Timée* de Platon,” in *L’alchimie et ses racines philosophiques: La tradition grecque et la tradition arabe*, ed. eadem, *Histoire des doctrines de l’Antiquité classique* 32 (Paris, 2005), 91–107, at 105.

31 For both, see S. Elm, “Priest and Prophet: Gregory of Nazianzus’s Concept of Christian Leadership as Theosis,” in *Priests and Prophets among Pagans, Jews and Christians*, ed. B. Dignas, R. Parker, and G. G. Stroumsa (Leuven, 2013), 162–84, at 169, 180. For Gregory’s choice to speak of οἰκείωσις, not ὁμοίωσις, and to coin the more radical term θέωσις, see S. Elm, *Sons of Hellenism, Fathers of the Church: Emperor Julian, Gregory of Nazianzus, and the Vision of Rome* (Berkeley, 2012), 176–81, 413–14.

32 *Platonic Theology*, 6.12, ed. H. Saffrey and L. Westerink (Paris, 1968–97), 6:64–65.

33 John of Damascus, *Die Schriften des Johannes von Damaskos*, vol. 1, *Dialectica*, §49/66^{5–6}, ed. B. Kotter (Berlin, 1969), 137 (cited by Ierodiakonou and O’Meara, “Philosophies,” 712): δ’. Φιλοσοφία ἐστὶν ὁμοίωσις θεῷ κατὰ τὸ δυνατόν ἀνθρώπῳ· ὁμοιούμεθα δὲ θεῷ κατὰ τὸ δίκαιον καὶ ὅσιον καὶ ἀγαθόν. Cf. Plato, *Θεαίτητος*, 176b2: ὁμοίωσις δὲ δίκαιον καὶ ὅσιον μετὰ φρονήσεως γενέσθαι. Now see also Merianos, “Alchemy,” 243 n. 76.

34 Attaleiates, *Ἱστορία*, 4 = §1.3, trans. A. Kaldellis and D. Krallis (Cambridge, MA, 2012), 5: καὶ τῷ στέψαντί σε Θεῷ κατὰ τὸ δυνατόν ἀνθρώπῳ γενέσθαι ὁμοίος περισπούδαστον ἔργον πεποιήσαι.

35 Assimilation to God could also be adapted as a definition of Christianity (though in at least some Byzantine views, these, at least their true varieties, are arguably synonymous). In the anti-Latin compilation known as *Panoplia*—attributed by its editor to Michael Keroularios but probably dating in fact to ca. 1274 (see

Where, then, did alchemy fit in the broader pattern of intellectual activity? Alchemy seems, at least on the surface, to be consistent with Paul Lemerle’s narrative that tenth-century “encyclopædism” paved the way for a more critical engagement with the resulting compilations.³⁶ (Critiques of Lemerle’s narrative and the concept of a middle Byzantine “encyclopædism” will be considered in §2 below.) The tenth- or eleventh-century M is, after all, a collection of texts and excerpts: alchemical recipes, treatises, commentaries, and interpretative essays. Then in the mid-eleventh century, we have the short treatise of the philosopher, rhetor, and courtier Michael Psellos (d. 1078 or after)³⁷ framed as a letter to Michael Keroularios, patriarch of Constantinople (1043–58), *On Making Gold*.³⁸ This text clearly articulates natural principles that might explain the transmutation of metals. It was popular in the early modern period, circulating both as part of the Greek alchemical

F. Tinnefeld, “Michael I. Kerullarios, Patriarch von Konstantinopel (1043–1058): Kritische Überlegungen zu einer Biographie,” *JÖB* 39 [1989]: 95–127, at 109–14, esp. 113)—it is stated on patristic authority that “a Christian is an imitation of Christ as much as possible for a human being”; *Panoplia*, 3.2, ed. A. Michel, *Humbert und Kerullarios* . . . , 2 vols. (Paderborn, 1924–30), 2:210^{5–7}: ὡσαύτως καὶ ὁ χρυσορῆμων πατήρ [John Chrysostom] καὶ οἱ λοιποὶ ἅγιοι πατέρες φασί· χριστιανός ἐστι μίμημα Χριστοῦ κατὰ τὸ δυνατόν ἀνθρώπῳ, λόγοις καὶ ἔργοις καὶ ἐννοίαις τὴν ἁγίαν τριάδα ὁρθῶς καὶ ἀμέμπτως πιστεύοντι.

36 P. Lemerle, *Le premier humanisme byzantin: Notes et remarques sur enseignement et culture à Byzance des origines au X^e siècle* (Paris, 1971), chap. 10. For the suggestion that M has something to do with Lemerle’s middle Byzantine encyclopædism, see Mertens, “Graeco-Egyptian Alchemy,” 222–23.

37 For Psellos’s self-portrait as a “philosopher-rhetor,” see S. Papaioannou, *Michael Psellos: Rhetoric and Authorship in Byzantium* (New York, 2013). For Psellos’s date of death, see p. 13 n. 26.

38 Edited in 1928 by Bidez, *CMAG*, 6:1–47. This edition of the text was printed with the anonymous Italian translation contained in Venice, Biblioteca Nazionale Marciana, gr. IV.44 (on which see Bidez, *ibid.*, 20–21) on facing pages (pp. 26–43). This text and translation were reprinted with commentary as *Michele Psello: La Crisopea, ovvero Come fabbricare l’oro*, ed. and trans. F. Albini (Genoa, 1988). This letter on chrysopoeia has been little studied. The brief discussion in a single paragraph of Magdalino and Mavroudi, “Introduction,” 18, is most insightful. Now see also Merianos, “Alchemy,” 243–45 (I would propose calling Psellos’s discussion of metallurgical transformation rational and scientific rather than “rationalistic” and “proto-scientific,” even if it is unelaborated). Merianos (*ibid.*, 245–46, 250) also discusses the portion of Psellos’s later indictment of Keroularios that deals with the patriarch’s alleged interest in alchemy and counterfeiting.

corpus and independently.³⁹ Psellos's letter makes clear the desirability of alchemical knowledge among the Byzantine elite of Constantinople. It is an eleventh-century alchemical treatise that could not have been written without access to the sorts of texts gathered together and systematized in *M*.

We might also ask conversely how a better understanding of Byzantine alchemy can sharpen our understanding of Byzantine scholarly activity—"encyclopedic" and otherwise—in the tenth and eleventh centuries. A focus on Psellos tends to make middle Byzantine interest in alchemy, as in other branches of philosophy, appear to the Byzantinist as a momentary flicker unique to Psellos and his students—turning alchemy into yet another way Psellos is left to seem as special as he insists.⁴⁰ After the production of a corpus of alchemical texts, did no one read and study it until Psellos? And where did the corpus come from? Was it based on an earlier corpus, as is often assumed? Or was it excerpted from various manuscripts extant at the time but now lost? Both scenarios suggest that there would have been other alchemical manuscripts circulating at the time, while Psellos's letter, with its almost seductive revelation of alchemy to its reader (although always stressing the discipline's rationality), implies at least some demand for such manuscripts: if the patriarch Keroularios was asking for metallurgical recipes to imitate gold (purely for intellectual purposes, of course, as Psellos's letter stresses), it seems a bit hasty to assume that no one else was interested in such things.

Still, a tendency to view the "encyclopedism" of the middle Byzantine cultural efflorescence as a mechanical and unenlightened salvaging act (although scholars of middle Byzantine literature have done much to revise this view)⁴¹ has meant that the production and

subsequent readership of manuscript compilations that date from the tenth and eleventh centuries—especially on technical subjects—have only gradually come to excite the interest of historians, being primarily the preserve of codicologists and the editors of individual texts within such corpora.⁴² In particular, most Byzantinists interested in middle Byzantine intellectual history have devoted little attention to *M*, in part out of an implicit assumption that the entire manuscript replicated a seventh-century compilation, even though, as a number of scholars have observed, it contains texts that must postdate the seventh century.⁴³ As a result, *M* remains an almost entirely untapped source for middle Byzantine intellectual history.⁴⁴

The present article takes a step toward writing *M* back into this history. To do so, I will begin by describing the manuscript, with a detailed discussion of its posited original arrangement (§1). With this established, I will then seek to characterize the contents and overall

Kazhdan, in collaboration with L. F. Sherry and C. Angelidi, *A History of Byzantine Literature*, 2 vols. (Athens, 1999–2006); M. D. Lauxtermann, *Byzantine Poetry from Pisides to Geometres*, vol. 1, *Texts and Contexts* (Vienna, 2003); F. Bernard and K. Demoen, eds., *Poetry and Its Contexts in Eleventh-Century Byzantium* (Farnham, Surrey, UK, 2012); Papaioannou, *Michael Psellos*. See also the discussion and references in Mavroudi, "Classical Tradition," 29 n. 4.

42 For the recent and growing list of exceptions, see §2 below.

43 This is clear, as Mavroudi stressed over a decade and a half ago, from the observation that *M* "contains two alchemical recipes . . . that refer to some of the ingredients by their Arabic names": Mavroudi, *Achmet*, 401–2 and 401 n. 33, see also 402–3. The passages to which she refers are *CAAG*, 2:346–48, namely, 346₁₀, 346_{18–19}, 347_{11–15}. I thank Maria Mavroudi for pointing me to her work on post-seventh-century texts in *M*. Berthelot believed that the core of this recipe is ancient but that it was then "redacted" between the seventh and eleventh centuries: *CAAG*, 3:330–31. Jean Letrouit also noted the contact with Arabic alchemy to which *M* attests: J. Letrouit, "Chronologie des alchimistes grecs," in *Alchimie: Art, histoire et mythes*, ed. D. Kahn and S. Matton, *Textes et Travaux de Chrysopœia* 1 (Paris and Milan, 1995), 11–93, at 65–66.

44 The case is similar for other famous Byzantine florilegia such as the *Palatine Anthology*, which has been carefully studied—for example, by A. Cameron, *The Greek Anthology from Meleager to Planudes* (Oxford, 1993)—to reconstruct earlier anthologies of Hellenistic epigrams upon which it is based. This is, of course, a worthy endeavor, but it leaves wide open the question of the Byzantine relevance of the *Palatine Anthology*. For the latter, see now F. Maltomini, "Selezione e organizzazione della poesia epigrammatica fra IX e X secolo: La perduta antologia di Costantino Cefala e l'*Antologia Palatina*," in *Encyclopedic Trends in Byzantium?*, ed. P. van Deun and C. Macé (Leuven, 2011), 109–24.

39 Moore's entry on this text lists forty-three manuscripts that contain it: P. Moore, *Iter Psellianum: A Detailed Listing of Manuscript Sources for All Works Attributed to Michael Psellos, Including a Comprehensive Bibliography* (Toronto, 2005), 90–94, no. 314.

40 For example, Hunger's standard entry on Byzantine alchemy jumps from the texts of the Greek alchemical corpus, supposedly a late antique compilation, to Psellos (eleventh century), and then to a thirteenth/fourteenth-century compendium of recipes: H. Hunger, *Die hochsprachliche profane Literatur der Byzantiner*, 2 vols., *Handbuch der Altertumswissenschaft* 12.5 (Munich, 1978), 2:280–2. For Psellos's claims to be intellectually unique, see Papaioannou, *Michael Psellos*, 14–16.

41 For example, M. Mullett, *Theophylact of Ochrid: Reading the Letters of a Byzantine Archbishop* (Aldershot, UK, 1997); A.

structure of the manuscript (§2) and in conclusion to situate this collection of texts and excerpts within middle Byzantine book culture (§3).

1. *Marcianus graecus* 299: Description and Reconstruction

M is a large codex containing 196 parchment folios (preceded and followed by paper flyleaves added much later) which measure approximately 305 × 240 mm; the space ruled for text measures 220 × 145 mm, with twenty-nine lines per page (occasionally thirty).⁴⁵ These folios are bound today in twenty-four quires plus a preliminary quire (known henceforth as “quire 0”) that is wrapped together with quire 1 by a parchment sheet added in a later rebinding. The manuscript’s main scribe wrote in a minuscule that has been variously dated to the tenth, the end of the tenth or beginning of the eleventh, the eleventh, the end of the eleventh, and the twelfth century.⁴⁶ A date of tenth or eleventh century is followed here. Semi-uncials are used for tables, figure captions, and other auxiliary material, as well as headings and subheadings within the main text. A number of later hands, most dated to the fourteenth and fifteenth centuries, made notes throughout

the manuscript, including copies of a variety of texts in quire 0.⁴⁷ Most of the text is written in brown ink, although headings are usually rubricated; additionally, quire 0 contains some ornamentation, and the beginning of the corpus proper—the first folio of quire 1—bears a highly ornamental blue, red, and gold “gate” framing the elegant archaizing uncials, in golden ink, in which the title of Stephen of Alexandria’s *Lecture 1* is expressed. Drawings of laboratory apparatus and alchemical emblems appear on a number of folios. The manuscript is currently bound in modern brown leather inscribed with the Venetian coat of arms (featuring Saint Mark as a lion).⁴⁸ It was part of Cardinal Bessarion’s (d. 1472) original bequest to the Republic of Venice.⁴⁹ **M**’s table of contents lists fifty-two titles, of which all but six (which were contained in one or more lost quires) are preserved in the manuscript.

Manuscript Tradition

The interrelationship of **M** and the other three most important Greek alchemical manuscripts is a complicated problem and one that is still open. These other manuscripts are Paris gr. 2325 (= **B**), dated to the thirteenth century;⁵⁰ Paris gr. 2327 (= **A**), copied in 1478 by one Theodore Pelekanos;⁵¹ and Florence, Bibl. Medicea Laurenziana, gr. 86.16 (= **L**), copied in 1492 by another unknown scribe named Anthony Draganas.⁵² These three later manuscripts contain many texts not in **M** in addition to those that **M** contains. Primarily on the

45 The most recent catalog entry of the manuscript—known more completely as Venice, Biblioteca Nazionale Marciana, gr. 299 (= Collocazione 584)—is E. Mioni, *Bibliothecae Divi Marci Venetiarum codices graeci manuscripti*, vol. 1, *Thesaurus antiquus: Codices 1–299* (Rome, 1981), 427–33 (hereafter *Bib. Ven. gr. mss. 1*), whose measurements (which are rounded to the nearest 5 mm) I reproduce. The manuscript had already been described extensively by Otto Lagercrantz in Bidez, *CMAG*, 2:1–22, along with an edition of the table of contents. C. O. Zuretti’s table of alchemical signs, which includes signs appearing in **M**, was published in *ibid.*, vol. 8. The number 584, sometimes used by the Biblioteca Marciana, derives from the manuscript’s place in *Inventory B* of Cardinal Bessarion’s collection (made in 1474); the manuscript is item number 440 in Bessarion’s original list of donation, *Inventory A* (made in 1468). On these and the other inventories, see L. Labowsky, *Bessarion’s Library and the Biblioteca Marciana: Six Early Inventories* (Rome, 1979).

46 The following paleographical judgments are enumerated in Mioni, *Bib. Ven. gr. mss. 1*, 427; *Les alch. gr. 4.1* Mertens, xxii; and Mavroudi, *Achmet*, 107 n. 50; Zanetti and Bongiovanni (1740) dated **M** to around the eleventh century; Morelli (1802) to the twelfth; Berthelot (1885) to the end of the tenth or beginning of the eleventh; Mioni (1981) to the end of the eleventh; and Cavallo (reported by Mertens) to the first half of the eleventh. Saffrey at first (1981) dated it to the tenth century, then later (1995) concurred with Berthelot’s judgment (tenth/eleventh). Boris Fonkič (reported by Mavroudi) dated it to the tenth century.

47 For the excerpt on dream interpretation and its identification as the beginning of an extant abridgment of the *Oneicriticon* of Achmet, see Mavroudi, *Achmet*, 107.

48 For such bindings, into which all manuscripts then in the collection were rebound between 1735 and 1742, see S. Pugliese, “Byzantine Bindings in the Marciana National Library,” in *The Book in Byzantium: Byzantine and Post-Byzantine Bookbinding*, ed. N. Tsironis (Athens, 2008), 219–52, at 219.

49 For a detailed account of Bessarion’s donation of his library to the Republic of Venice—and the strict condition that it remain a public library, accessible to all scholars regardless of their country of origin and at no cost—see Labowsky, *Bessarion’s Library*.

50 *Les alch. gr. 4.1* Mertens, xxix.

51 *Les alch. gr. 4.1* Mertens, xxxii.

52 *Les alch. gr. 4.1* Mertens, xxxix. For descriptions of all four of these manuscripts, see Bidez, *CMAG*, as well as the detailed discussion in *Les alch. gr. 4.1* Mertens, xxii–xlili. One might add that the text of **L**’s colophon appears to be based on that of **A**’s colophon (both printed by Mertens).

basis of comparison between the contents of all four manuscripts, Mertens concluded that “the first part of **A** derives from a source identical to **B**, and that **L** is very close to **A**.”⁵³ On the controversial question of how the corpus as represented by **B** and **A** relates to **M** (i.e., whether **BA** and **M** are mutually independent, or **BA** is dependent on **M** for the texts that they share), Mertens states that it is impossible to know as of yet, especially without a complete collation of the manuscripts. Andrée Colinet has recently argued, rightly, that the whole question needs to be examined systematically for each text in the corpus for there to be any hope of reaching a conclusive answer.⁵⁴

Quires and Binding

At least since Cardinal Bessarion in the fifteenth century, scholars had been well aware that **M** was no longer in its original state: folios or even whole quires were missing and the order of the texts did not match the table of contents written in a hand contemporary with the manuscript’s original composition. In 1991 Henri Saffrey presented an economical solution to this problem: the manuscript in Venice preserved almost all of the original folios, but its quires had been jumbled.

53 *Les alch. gr. 4.1* Mertens, xlii.

54 *Les alch. gr. 4.1* Mertens, xlii–xliii. For the arguments of Richard Reitzenstein, Otto Lagercrantz, and others on this question, see *ibid.*, xliii n. 96. Letrouit (“Chronologie,” 11) asserted that all other manuscripts were completely dependent on **M** for those texts that they share, but the arguments he offered are not conclusive. Conversely, in his edition of the Democritan and related alchemical texts (ps.-Dem. Martelli), Martelli treated **BA** and **M** as mutually independent, but Colinet (review of ps.-Dem. Martelli) critiqued this, arguing that (1) the variants that Martelli adduced in support of independence are easily attributed to scribal corrections and the like (p. 436) and so do not overcome the problem of the lacuna that interrupts Stephen of Alexandria’s *Lecture* 9 in all three manuscripts and that corresponds to the end of a quire in **M** (this being the focus of Reitzenstein’s and Lagercrantz’s arguments concerning dependence/independence; see p. 435); (2) contamination from different sources is not sufficient to explain the evidence (p. 436); and (3) in the case of the Democritan and related texts that Martelli edited, **B** and **A** (and another manuscript that Martelli discussed as well, Vat. gr. 1174 = **V**) descend from the text of **M** or from a very closely related manuscript. On the overall question, Colinet concluded: “Le problème devrait être repris *ab ovo*, je pense, auteur par auteur, en tenant compte aussi des équivalents linguistiques de la langue grecque à l’époque alexandrine et médiévale, des usage rédactionnels des recettes, des distractions habituelles des copistes et de leur propension à la correction” (p. 437).

With this contention, Saffrey proposed a reconstruction of the quires’ original order, in which there were only several places for which a lacuna of one or more quires had to be posited.⁵⁵ In 2002 Jean Letrouit (who had presented at the same conference where Saffrey first proposed his results) published a paper that opens with a “refutation of H. D. Saffrey,” that is, of Saffrey’s reconstruction; pointing out a codicological mistake in Saffrey’s paper, Letrouit declared that any number of reconstructions were possible based on the evidence and that there was no proof that the table of contents should correspond to the manuscript’s original state.⁵⁶

This codicological debate has so far taken place in a rather laconic fashion. To provide for clarity and a basis for further discussion, I present here the arrangement of quires according to my own observations. I will then describe my own reconstruction, in dialogue with both Saffrey’s 1995 article on the original arrangement of the **M** quires and Letrouit’s 2002 “refutation.”⁵⁷

In its present form, **M** contains twenty-four quires (or twenty-five, depending on how one counts). Eight (or nine) of these are not ordinary quaternions (for diagrams of these irregular quires, see fig. 1). The manuscript’s quires may be summarized as:

0+1*₁₋₁₅ 2⁸₁₆₋₂₃ 3⁸₂₄₋₃₁ 4⁸₃₂₋₃₉ 5⁸₄₀₋₄₇ 6⁸₄₈₋₅₅
 7⁸₅₆₋₆₃ 8⁸₆₄₋₇₁ 9⁸₇₂₋₇₉ 10⁸₈₀₋₈₇ 11*₈₈₋₉₅
 12⁸₉₆₋₁₀₃ 13⁸₁₀₄₋₁₁₁ 14*₁₁₂₋₁₁₈ 15⁸₁₁₉₋₁₂₆ 16⁸₁₂₇₋₁₃₄
 17*₁₃₅₋₁₄₀ 18*₁₄₁₋₁₄₈ 19*₁₄₉₋₁₅₆ 20*₁₅₇₋₁₆₄ 21⁸₁₆₅₋₁₇₂
 22⁸₁₇₃₋₁₈₀ 23*₁₈₁₋₁₈₈ 24⁸₁₈₉₋₁₉₆

55 This paper was first presented at a conference, then published as H.-D. Saffrey, “Historique et description du manuscrit alchimique de Venise Marcianus Graecus 299,” in Kahn and Matton, *Alchimie*, 1–10.

56 J. Letrouit, “Hermétisme et alchimie: Contribution à l’étude du Marcianus Graecus 299 (=M),” in *Magia, alchimia, scienza dal ’400 al ’700: L’influsso di Ermete Trismegisto*, ed. C. Gilly and C. van Heertum, 2 vols. (Florence, 2002), 1:85–109. The paper is mostly devoted to an edition, translation, and commentary of the text that he designates as Zosimos’s treatise *Discourse Omega*. (The paper he presented at the 1991 conference was published as Letrouit, “Chronologie.”)

57 I studied the manuscript in person at the Biblioteca Marciana, 16–20 June 2014. At that time, I was not aware of Letrouit’s article. My observations led me to draw a number of conclusions already expressed in that article, although I disagree with some of Letrouit’s claims.

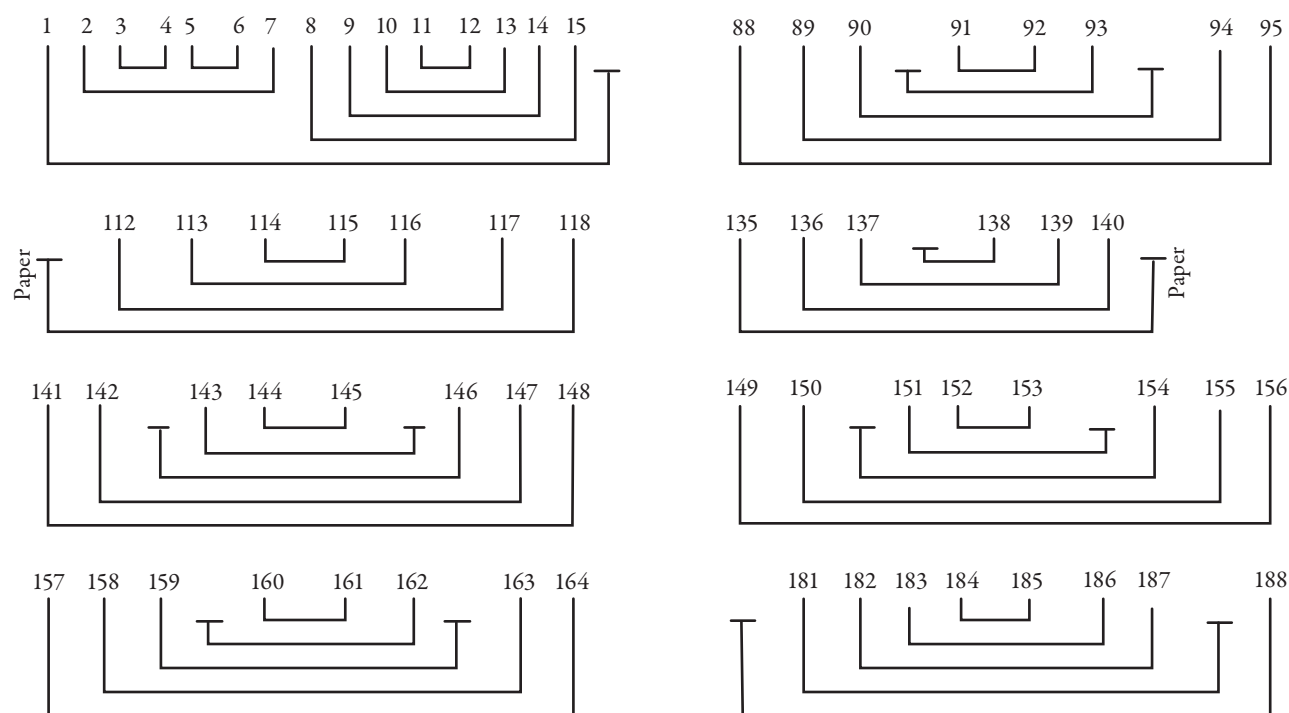


Fig. 1. Quire arrangements of all eight irregular quires (or nine if fols. 1–15 are regarded as two quires) of Venice, Biblioteca Nazionale Marciana, gr. 299: **0**+**1**_{1–15}, **11**_{88–95}, **14**_{112–118}, **17**_{135–140}, **18**_{141–148}, **19**_{149–156}, **20**_{157–164}, **23**_{181–188}. The rest of the manuscript's folios are quaternions (i.e., four sheets stacked, then folded to create a quire of eight folios).

Quire numbers are boldface, followed by a superscript indicating whether it is a quaternion (marked by an “8”) or irregular (marked by an asterisk), and by a subscript indicating the quire's folio range.

The manuscript's first fifteen folios have been the source of some confusion. While quires 2–24 have been numbered in the Arabic numerals of a Latin hand, which Saffrey dates to the fifteenth century, the first fifteen folios bear no quire numbers.⁵⁸ In his article Saffrey treated the first seven folios as a “preliminary quire,” implying (since fol. 16 is the start of quire 2) that fols. 8–15 formed a first quire proper; Mertens, following him, explicitly calls fols. 8–15 “quire 1.”⁵⁹ For consistency, I do the same by referring to fols. 1–7 as quire 0 and fols. 8–15 as quire 1, even though the matter is somewhat more complicated than Saffrey described it. Saffrey stated⁶⁰ that the “preliminary quire” (fols. 1–7)

was originally a ternion (fols. 1, 2, 5, 6, 7, *7bis*, where 1+*7bis* formed a bifolio that was left blank),⁶¹ of which the last folio (fol. *7bis*) was later cut out, and into which a bifolio (fols. 3–4) was later inserted (see fig. 2).

Saffrey's reconstruction is not entirely correct. Folios 3–4 are indeed a later insertion, but as Letrouit pointed out⁶² (and my observation confirms), there is no stub between fols. 7 and 8, but there is a stub between fols. 15 and 16, which is clearly attached to fol. 1. Furthermore, fols. 1, 3, 4, and stub 15/16 are all ruled differently from the rest of the folios (tighter lines, covering the whole page, rather than leaving an unruled margin). Letrouit also reports that these two sheets are palimpsests. For my part, I did observe that fol. 1^v and the recto side of stub 15/16 (i.e., a single side of that sheet) bear traces of an earlier text, most notably

58 Saffrey, “Historique,” 1, 3.

59 Ibid., 2; *Les alch. gr. 4.1* Mertens, xxv, xxviii.

60 Saffrey, “Historique,” 2.

61 Letrouit (“Hermétisme et alchimie,” 85) gave the name *7bis* to Saffrey's phantom folio. It is unclear how Saffrey inferred that both folios were blank in the absence of his posited *7bis*.

62 Letrouit, “Hermétisme et alchimie,” 85.

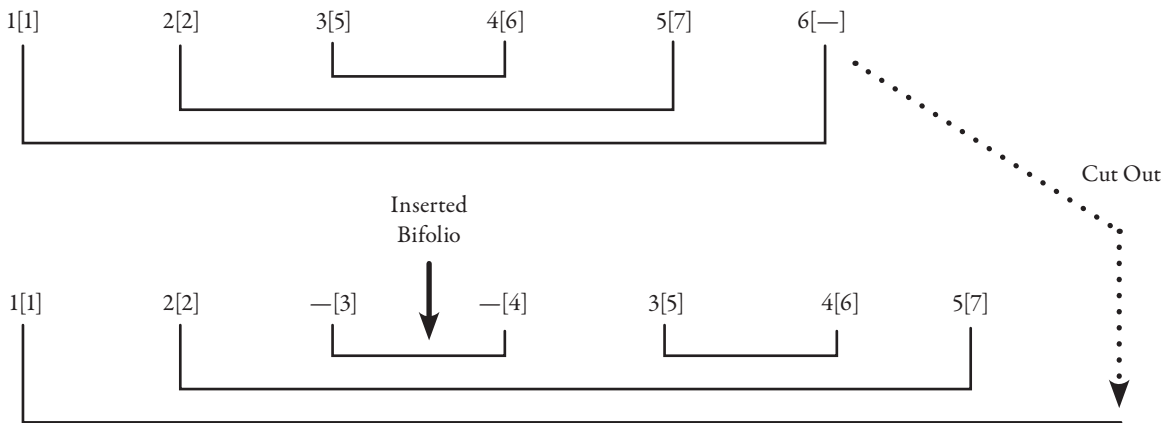


Fig. 2. Diagram of Saffrey's reconstruction of Venice, Biblioteca Nazionale Marciana, gr. 299, quire 0 (Saffrey's "preliminary quire")—which is to be modified slightly. Above: Saffrey's reconstruction of this quire's original state. Below: Quire 1 in its present state as Saffrey described it. Folio numbers used by Saffrey in his hypothetical reconstruction are followed in brackets by the present-day folio numbers.

bright red initial letters; on fols. 3–4 the clearest example is on fol. 4^r, where an astronomical diagram in black ink is drawn on top of an earlier, faded text ruled in two columns.⁶³ In any case, we may conclude that the original sheets remaining in quire 0 are fols. 2, 5, 6, 7—although, of course, there may have been other original sheets which have since been lost. Before being enclosed with quire 0 by the sheet made up of fol. 1 and the stub between fols. 15 and 16, quire 1 (fols. 8–15) was originally an ordinary quaternion (see fig. 1).

The original order of the quires will also be central to this article's discussion, in particular the question of whether the manuscript's texts were originally arranged according to the order given in the table of contents on fol. 2^{r-v}.

The manuscript as it is now bound is certainly not in its original order. Readers already in the fifteenth century (probably including Cardinal Bessarion) referred in marginal notes to the manuscript's lacunas. Saffrey's proposal that the table of contents, written in the same semi-uncial hand as lemmas appearing throughout the manuscript, reflects the original order of texts in the manuscript⁶⁴ was declared impossible by

Letrouit, who pointed out two places where stubs may coincide with lacunas.⁶⁵

First, there appears to be a lacuna before fol. 112, where a stub indicates a page was cut out. In Mertens's edition of Zosimos's *Authentic Memoirs*, she follows Saffrey's reconstruction of the original quire order.⁶⁶ The text that she edits as *Authentic Memoir 7* appears twice in M, though both times only partially: once in the middle of quire 23 (at fols. 186^r₂₂–186^v₁, containing lines 3–14 of her edition) and once at the end of quire 24 plus the beginning of quire 14 (fols. 195^r₂₂–196^v₂₉, containing lines 1–7 and 15–42, and then continuing on fol. 112^r_{1–12}, containing lines 43–52).⁶⁷ Mertens indicates that there is probably a lacuna in the text, or at least a missing drawing, precisely at the transition from fol. 196^v to fol. 112^r,⁶⁸ but this lacuna would have appeared *within* a single text, thus causing

63 Letrouit, "Hermétisme et alchimie," 85, 86–87.

66 *Les alch. gr. 4.1* Mertens. Although Mertens's edition of Zosimos's works was published seven years earlier in the well-known and widely distributed series of texts by Les Belles Lettres, Paris, Letrouit makes no mention of it.

67 See the apparatus in *Les alch. gr. 4.1* Mertens, 23. The edition of *Authentic Memoirs 7* is printed on pp. 23–25.

68 *Les alch. gr. 4.1* Mertens, 25 and n. 31 (printed on p. 193). The situation with this text becomes even more complicated once the evidence of A and L is considered; see *ibid.*, 25 n. 32.

63 This is where Letrouit ends his discussion of quire 1 as such, since his purpose is to refute Saffrey.

64 Saffrey, "Historique," 1–7.

no problem for the hypothesis that the table of contents corresponds to the manuscript's original arrangement.

Second, Letrouit suggests there may be a lacuna before fol. 181, the first folio of quire 23, where again there is a stub. At the end of quire 22 in *M* is a text called Zosimos's *Chapters to Theodore*.⁶⁹ Although the text is probably an abridgment, as Mertens argues, this abridgment appears to be preserved in its entirety in *M*, coming to an end on fol. 180^v, with sixteen "chapters" in total, even though the table of contents had advertised only fifteen.⁷⁰ By contrast, two possibly independent manuscript witnesses to the alchemical corpus do have a lacuna here—their text of these "chapters" cuts off midway and abruptly jumps into the middle of *On Making Gold* by the Anonymous Philosopher, which is also the next text in *M*. In other words, they are missing the end of the *Chapters to Theodore* and the beginning of the Anonymous Philosopher's *On Making Gold*, about thirty-four lines. Mertens reasonably concludes that "such a lacuna would be most justifiably explained by the loss of one folio in an exemplar of small format."⁷¹ It is unlikely that such an exemplar would have had room for another text between Zosimos's work and that of the Anonymous Philosopher. This does not absolutely rule out the possibility that *M* nevertheless did originally have a text between the two (on the folio that was originally attached to the stub appearing before fol. 181), but the most economical hypothesis would seem to be that it never did, since this avoids positing a lacuna where nothing we would expect to be present is missing.

But then why the stub? Like most of the stubs in *M* it is best explained by an overall consideration of how the manuscript's quires were assembled. As Letrouit acknowledges,⁷² most stubs were formed in quires before texts were copied into them (as is clear from the continuity of texts from one side of a stub to the other). The question therefore should be: Why

were quires originally prepared with "missing" folios, as represented by these stubs? I would suggest that this is simply because the parchment severed from each of those stubs was flawed or considered otherwise unfit to be used in the production of the manuscript. Clearly the scriptorium that produced the volume sought to use eight-folio quires (i.e., quaternions), which are standard for Byzantine manuscripts.⁷³ The standard way to construct an eight-folio quire is to fold a stack of four sheets in half. But *M* is a large-format volume. If a scriptorium has a piece of parchment that is smaller than a two-folio sheet but larger than a single folio, to avoid discarding a perfectly good piece of parchment the scriptorium might use it to create a folio-plus-stub sheet; two such pieces might then be inserted into a ternion in a staggered fashion to produce an eight-folio quire. This seems to be precisely what happened in the case of quires 11, 18, 19, 20, and 23 (see fig. 1). It should thus come as no surprise to find that there is no lacuna before the first folio of quire 23, fol. 181.

Letrouit's purpose in pointing out these possible lacunas seems again to be simply to refute Saffrey's codicological description, which claimed that all but the first and "last" quires are quaternions. This is not quite the case, as Letrouit stresses, although most of the irregular quires do still consist of eight folios in their present form, with only three exceptions:⁷⁴ quires 0, 14, and 17 (see fig. 1). For our purposes, it is important to note that neither of the possible lacunas that Letrouit adduces is inconsistent with Saffrey's reordering of the quires.

Letrouit concludes his discussion of lacunas with an assertion that overstates the indeterminacy of the evidence:

The *Marcianus* therefore displays, in three or four places, textual lacunas following upon the loss of folios (after fols. 39, 111, 140 and 180). It is not possible to determine with certainty the extent and content of these lacunas in the absence of *M*'s exemplar or another manuscript copied from this exemplar.⁷⁵

69 The table of contents adds τε', that is, fifteen chapters; the text appears in *A* and *L* with no mention of Zosimos and is also left anonymous in other, possibly independent witnesses of the alchemical corpus. See *ibid.*, lxi.

70 *Ibid.*, lxiv. See further p. 90 below.

71 For this analysis, see *ibid.*, lxii–lxiii, quotation at p. lxiii: "Longue d'environ trente-quatre lignes de texte, une telle lacune s'expliquerait le plus valablement par la chute d'un folio dans un modèle de petit format."

72 Letrouit, "Hermétisme et alchimie," 86.

73 E. Mioni, *Introduzione alla paleografia greca* (Padua, 1973), 34.

74 Assuming we treat quire 1 as a regular quaternion—which it is, but for being wrapped together with quire 0 by fol. 1 and its stub.

75 Letrouit, "Hermétisme et alchimie," 86: "Le *Marcianus* présente donc, en trois ou quatre endroits, des manques de texte consécutifs à des pertes de feuillets (après les fol. 39, 111, 140 et 180). Il n'est

As we have seen, there may well be a lacuna after fol. 111, although there is probably no lacuna after fol. 180—and neither of these lacunas is inconsistent with Saffrey’s reconstruction. After fol. 39 there is certainly a lacuna, which Saffrey explained by the loss of one or more quires primarily containing works ascribed to the emperors Heraclius and Justinian (on the basis of the table of contents);⁷⁶ Letrouit offers no alternative explanation. Likewise, there is no question that a folio is missing after fol. 140, containing the end of the excerpt from Photios’s *Bibliotheca*, which is itself a passage from Agatharchides (fl. ca. 116 BCE) on gold mines in the Red Sea region.⁷⁷ Saffrey addressed this lacuna as well, considering it to have been cut out at a later date.⁷⁸ How Saffrey justifies this text’s absence from the table of contents is unsatisfying, but again Letrouit offers no alternative hypothesis. To suggest that there is no way to infer the length and contents of these lacunas seems somewhat disingenuous since it ignores the extent to which Saffrey’s reordering of the quires is consistent with the lacunas and helps explain them.⁷⁹

Letrouit’s graver claim is that there is evidence that directly contradicts Saffrey’s hypothesis that the table of contents is original to the manuscript such that it can be used to reconstruct the manuscript’s original arrangement. In particular, Letrouit adduces thirteen texts appearing in the manuscript but not in the table of contents.⁸⁰ As it turns out, all of these are consistent with the hypothesis that the table of contents is original to the manuscript.

The thirteen texts amount to only four contiguous portions of text: (1) front matter, (2) an extract of

pas possible de déterminer avec certitude l’étendue et le contenu de ces lacunes, faute de disposer du modèle de M, ou d’un autre manuscrit copié sur ce modèle.” I have modified the English translation published in parallel with Letrouit’s original French text.

76 Saffrey, “Historique,” 4.

77 From his *Περὶ τῆς Ἐρυθρᾶς θαλάσσης* (*On the Red Sea*). Diodoros of Sicily quotes excerpts from the same work. See *Oxford Classical Dictionary*, 2nd ed. (1970), s.v. “Agatharchides.”

78 Saffrey, “Historique,” 6–7.

79 To the lacunas Letrouit lists should be added the lacuna before fol. 141 that Mertens notes (*Les alch. gr.* 4.1 Mertens, xxvii), since the text at the beginning of fol. 141^r (Zosimos, *Chapters to Eusebeia*) is missing its beginning. Following Saffrey’s reconstruction, Mertens considers the preceding folio in the manuscript’s original arrangement to have been fol. 95^v, which ends with a text by “Hermes” or the beginning of this text (Mertens suggests the latter, p. xxvi).

80 Letrouit, “Hermétisme et alchimie,” 86.

Zosimos’s *On Quicklime*, (3) texts by Zosimos appearing on fols. 112–118, and (4) the caption “Cleopatra’s *On Making Gold*” appearing at the top of a page of diagrams (fol. 188^v).

All the texts in the first portion belong to quire 0: the dedicatory epigram (fol. 5^v), the list of alchemical symbols (fols. 6^r–7^v), and the list of alchemical authors (fol. 7^v). These are all texts that could be considered front matter, meant to present the book and aid the reader in navigating and making use of the texts it contains. They are not texts of the alchemical corpus proper. As such, it is no surprise to find that the table of contents does not mention them (just as we are not surprised to find no entry in the table of contents mentioning the table of contents itself).

The second portion consists of a single text: *Zosimos says (concerning quicklime)* (fol. 95^r₁₆–95^v₂₄).⁸¹ Its absence from the table of contents is explicable simply by considering how the text appears in M. Its heading, “Zosimos says” (Ζώσιμος λέγει), is placed on its own line in the same brown ink as the main text, not in red ink like most titles in the codex. The words “Concerning quicklime” (Περὶ τῆς ἀσβέστου), which Letrouit, Mertens, and others (rightly) construe as part of an original heading, are formatted here as if they begin the text, such that the heading reads simply “Zosimos says.” This could have made it look like a subsection of the previous text,⁸² which is also by Zosimos and is clearly marked as such in the manuscript in red ink: Zosimos the Divine, *On Excellence*.⁸³ It would

81 Ζώσιμος λέγει (περὶ τῆς ἀσβέστου), ed. *Les alch. gr.* 4.1 Mertens, 48–49; *CAAG*, 2:113–14 (up to line 20; their §3 is omitted here in M). In A and L, the title begins “Zosimos said . . .” (ὁ Ζώσιμος ἔφη περὶ τῆς ἀσβέστου, *Les alch. gr.* 4.1 Mertens, 48). Letrouit calls this text “*Sur la chaux* de Zosime” (“*On Lime*, by Zosimos”). Mertens explains (*ibid.*, 232–33) that the word ἀσβεστος (“unquenchable, inextinguishable”—LSJ, s.v.) used as a substantive can stand for ἀσβεστος τιτανος, lit. “inextinguishable lime,” a term that refers to “chaux vive,” or “quicklime,” i.e., calcium oxide (CaO), whose production she also discusses. Mertens further points out that the text’s contents suggest that this is indeed the substance to which the heading refers.

82 It also suggests that this text on quicklime might have originated as a scholion, which was then copied as part of the corpus proper.

83 Ζωσίμου τοῦ θεοῦ περὶ ἀρετῆς, M 92^v–95^r. Mertens edited the text as *Authentic Memoir 10: Les alch. gr.* 4.1 Mertens, 34–42. On the basis of other manuscripts, Mertens considers the full title to be Ζωσίμου τοῦ θεοῦ περὶ ἀρετῆς, περὶ συνθέσεως τῶν ὑδάτων, <πράξις> α^η [= πρώτη] (“Du divin Zosime, sur l’excellence: sur la composition

have been easy for the drafter of the table of contents to consider the passage marked “Zosimos says” to be part of Zosimos’s *On Excellence* and thus to omit this awkward “title” from the table of contents. Even if an error, it is still no proof that the table of contents was meant to describe a manuscript other than **M**.

The third portion omitted from the table of contents, as Letrouit points out, is a series of short texts that, in Saffrey’s reconstruction, follow upon Zosimos’s *On the Letter Omega* (fols. 189^r–196^v, then continuing on fols. 112^r–115^r), the first of the texts falling under the heading: “By the same Zosimos, *Authentic Memoirs on Instruments and Furnaces*.”⁸⁴ After what Mertens calls the end of *On the Letter Omega* (= *Authentic Memoir 1*), and only after another heading—“Zosimos, *On Instruments and Furnaces*”⁸⁵—and further text, come a series of texts not mentioned in **M**’s table of contents. The first text begins, “The earthen vessel has a hole and covers the bowl that is on the *kērotakis*”; Mertens edits this text, which takes up twelve lines in **M** (112^r_{1–12}), as a continuation of *On Instruments and Furnaces* from

des eaux, première <leçon>”). A variant of the additional part of the title appears in **M** (92^v) as the beginning of the text: Θεσις ὑδάτων (the text continues: καὶ κίνησις . . .). Part of this text (**M** 92^v_{25–93^r₇} ἡ φύσις = Mertens’s lines 1–16 = *Authentic Memoir 10.1*) also appears elsewhere in **M** (115^r_{5–17}).

Authentic Memoir 10 forms, along with 11 and 12, a cohesive series of dreams or visions known as the “Visions of Zosimos,” analyzed most famously by Carl Jung (see *Les alch. gr. 4.1* Mertens, 207). However, **M** does not include the latter two memoirs, and whereas it follows *Authentic Memoir 10* immediately with *Zosimos says (concerning quicklime)*, in **A** and **L** *Zosimos says concerning quicklime* is nowhere near the texts that Mertens edits as the *Authentic Memoirs*: in **A** it was copied by a later hand onto some folios near the beginning of the manuscript as part of a collection of excerpts; similarly, in **L** it appears near the end of the manuscript, also among such excerpts. It is entirely absent from **B**: see *Les alch. gr. 4.1* Mertens, 232.

84 Τοῦ αὐτοῦ Ζωσίμου περὶ ὀργάνων καὶ καμίνων Γνήσια Ὑπομνήματα. Περί τοῦ ω στοιχείου, *ibid.*, 1–10. For Mertens’s argument in favor of separating the heading Τοῦ αὐτοῦ Ζωσίμου περὶ ὀργάνων καὶ καμίνων Γνήσια Ὑπομνήματα from the heading Περί τοῦ ω στοιχείου, see *ibid.*, 51–52. To avoid confusion, I should note that the text that Letrouit edits as *Discours oméga* (“Hermétisme et alchimie,” 91–95) corresponds to the text Mertens divides into two: *Authentic Memoir 1* (which she calls *Sur la lettre oméga*, = Letrouit §1–14) and *Authentic Memoir 2* (which she notes is “sans titre,” = Letrouit §15–16). These two texts are continuous in **M**, but Mertens justifies their separation by the fact that the other manuscripts, which do not include her *Authentic Memoir 1*, contain *Authentic Memoir 2* as its own separate text (*Les alch. gr. 4.1* Mertens, 120).

85 Ζωσίμου περὶ ὀργάνων καὶ καμίνων, *Les alch. gr. 4.1* Mertens, 23.

fol. 196^v (which presupposes Saffrey’s reconstruction).⁸⁶ This text does not trouble Letrouit at this point because it does not have its own heading (though he already mentioned the locus as the potential site of a lacuna, as discussed above); he does not mention it as one of the texts missing from the table of contents.⁸⁷

A sequence of texts follows, which Letrouit adduces as missing from the table of contents: *On the Vaporization of Divine Water Which Fixes Quicksilver* (112^r₁₃–113^r₂₆; the last three lines of fol. 113^r are left blank),⁸⁸ *On the Same Divine Water* (113^v₁–115^r₄),⁸⁹ an excerpt from a text by Zosimos under the heading *On the Composition of Waters* (115^r_{5–17}),⁹⁰ *On Fires* (115^r_{18–19}),⁹¹ *Introductory Advice for Those Undertaking*

86 *Authentic Memoir 7.6*, *Les alch. gr. 4.1* Mertens, 25: Ὅπῃν ἔχει τὸ ὀστράκινον ἄγρος καλύπτων τὴν φιάλην τὴν [Mertens emends this to τὸ, against the unanimous reading of the manuscripts] ἐπὶ τὴν κηροτακίδα, and translates: “Le vaisseau de terre cuite qui couvre la phiale et qui est sur la *kērotakis* est muni d’un trou.” By emending τὴν to τὸ, Mertens places the earthen vessel, rather than the pan (φιάλη), on top of the κηροτακίς.

87 Letrouit, “Hermétisme et alchimie,” 86.

88 Περί τῆς ἐξατμίσεως τοῦ θείου ὕδατος τοῦ πῆσσοντος τὴν ὑδράργυρον, *Les alch. gr. 4.1* Mertens, 26–29, edited as *Authentic Memoir 8*. Mertens’s translation of the title is “Sur la vaporisation de l’eau divine qui fixe le mercure,” against Letrouit’s “112–113. *Sur la vaporisation de l’eau de soufre*, anonyme attribuable à Zosime, avec titre spécial.” Letrouit has read τοῦ θείου as the substantive meaning “sulfur.” Martelli has argued that there is an intentional ambiguity, at least in pseudo-Democritus and his commentators, between “sulfur water” and “divine water”: “‘Divine Water’ in the Alchemical Writings of Pseudo-Democritus,” *Ambix* 56.1 (2009): 5–22.

89 Περί τοῦ αὐτοῦ θείου ὕδατος, *Les alch. gr. 4.1* Mertens, 30–33, edited as *Authentic Memoir 9*. Letrouit: “113^v–115. *Sur la même eau divine*, anonyme tardif, avec titre spécial.” Mertens considers most of this work to be from Zosimos’s pen, namely, *Authentic Memoir 9.1–3* (lines 1–73, i.e., up to καὶ ἔσται σοι χρυσός), but for the final paragraph (*Authentic Memoir 9.4*, lines 74–81), which is the work of a later “compiler” (*Les alch. gr. 4.1* Mertens, 205–6 n. 16). Letrouit seems to have concluded that the whole text was late on account of the Christian language with which this last paragraph ends: “Ἐρρωσθε ἐν Χριστῷ τῷ Θεῷ Ἰησοῦ, ἀμήν (thus in **M**; cf. Mertens’s edition of this final formula, p. 33: “Ἐρρωσθε ἐν Χριστῷ Ἰησοῦ τῷ Θεῷ ἡμῶν πάντοτε νῦν καὶ ἀεὶ καὶ εἰς τοὺς αἰῶνας τῶν αἰώνων, ἀμήν, which corresponds precisely only to the text of **A**).

90 **M** places under this heading the beginning only of a text known elsewhere as “Zosimos the Divine’s *On Excellence, on the Composition of Waters*, first <lecture>”; see n. 83. Letrouit has “115. *Sur la composition des eaux*, anonyme, avec titre spécial. Il s’agit du commencement du traité *Sur la vertu* de Zosime.”

91 Περί φώτων [lit. *On Lights*], of which the entire text is a single line reading Ἐλαφρὰ φῶτα πᾶσαν τὴν τέχνην ἀναφέρει (**M** 115^r₁₉);

the Art (115^r₂₀–115^v₂₈),⁹² *Making Crystals* (115^v₂₉–116^v₁₆; the heading is the last line on fol. 115^v),⁹³ an untitled text on “sublimed vapors” (116^v–118^r),⁹⁴ and *On Whitening* (118^r_{2–14}).⁹⁵ Why might these texts have been omitted from the table of contents? To begin with, they are quite brief; one of them (*On Fires*) is only a single line, not counting the heading. Furthermore, of all these texts, only the first two (*On the Vaporization of Divine Water Which Fixes Quicksilver* and *On the Same Divine Water*) bear headings that are distinguished from the text by the color of their ink. (The other headings are written in semi-uncials, like all headings in the manuscript, and set off on their own line, but they are written in the same brown ink as the text.) One of the headings (*Making Crystals*) is on the last line of a page and not very conspicuous. All these headings would have been easy for the compiler of the table of contents to skip.

Why are the two headings highlighted by the use of red ink nevertheless absent from the table of

this line is printed as part of a longer text entitled Ἐρμηνεία περὶ πάντων ἀπλῶς καὶ περὶ τῶν φώτων in *CAAG*, 2:247_{10a} (based on the text of **A** and **B**); see also Mioni, *Bib. Ven. gr. mss.* 1, 431. Letrouit has “115. *Sur les feux*, anonyme, avec titre spécial.”

92 Παραινέσεις συστατικαὶ τῶν ἐγχειρούντων τὴν τέχνην, ed. *CAAG*, 2:1448–1451₄ (text of **M**, collated with other manuscripts). Mertens translates the title as “Exhortations pour recommander l’art à ceux qui l’entreprennent” (*Les alch. gr.* 4.1 Mertens, xxvii); Letrouit has “115 [sic]. *Conseils à suivre par ceux qui entreprennent de pratiquer l’art*, anonyme tardif, avec titre spécial.”

93 Ποίησις κρυσταλλίων, ed. *CAAG*, 2:3488–350₃ (text of **M**, collated with other manuscripts). Merten translates the title as “Fabrication des cristaux” (*Les alch. gr.* 4.1 Mertens, xxvii); Letrouit has “115^v–116^v. *Fabrication des cristaux*, anonyme tardif, avec titre spécial.”

94 No title; text is Αἰθάλαι δὲ λέγονται—ἡ τρεῖς ἢ τέσσαρας, ed. *CAAG*, 2:250₁₂–252₂₁ (text of **M**, collated with other manuscripts). Mertens refers to the text as “Sans titre (sur les sublimés)” (*Les alch. gr.* 4.1 Mertens, xxvii); Letrouit has “116^v–118. *Sur les vapeurs*, anonyme citant Zosime à la troisième personne, sans titre.” The text is separated from the preceding text (*Making Crystals*) by a skipped line (l. 17), beginning on what would have been line 18; three more such line breaks appear within this untitled text.

95 Περί λευκώσεως, ed. ps.-Dem. Martelli, 254; *CAAG*, 2:2113–11. Mertens renders the title “Sur le blanchiment” (*Les alch. gr.* 4.1 Mertens, xxvii); Letrouit has “118. *Sur le blanchiment*, anonyme, avec titre spécial. Il s’agit d’un extrait du traité de Synésios adressé à Dioscore.” Martelli (ps.-Dem. Martelli, 462) considers this to be three separate excerpts (each separated from the others by a divider and rubrication), of which only the second and third seem to be derived from Synesios’s work, perhaps from lost portions of the dialogue with Dioskoros.

contents? Recall that according to Saffrey’s reconstruction, the quire previous to fol. 112 is quire 24 (fols. 189–196), which is taken up entirely by a text of Zosimos, *On Instruments and Furnaces*, whose heading appears at the top of its first page and in the table of contents. The quire ends with drawings of instruments (frequently reproduced in modern works on ancient alchemy), at the bottom of fol. 195^v, at the top of fol. 196^r, and filling the whole of fol. 196^v. Our two “missing” texts (in Saffrey’s reconstruction) would come next. Given the distraction of these rubricated drawings, it is easy to see how a heading might have been missed. More importantly, however, even a closer look at the texts falling under those headings might have convinced a reader that those texts were part of Zosimos’s treatise *On Instruments and Furnaces* (as indeed Mertens, the text’s modern editor, concluded),⁹⁶ for the first text (*On the Vaporization of Divine Water Which Fixes Quicksilver*) begins with a discussion of vessels and even refers to “this diagram of the instrument,”⁹⁷ and the discussion then flows easily into the second text (*On the Same Divine Water*). The compiler of the table of contents could have chosen to include separate entries for these items, but there is nothing that would have required this choice.

So much for the first three portions of text noted by Letrouit as absent from the table of contents. The fourth and final portion consists of a single line that appears on a page dedicated to diagrams (fol. 188^v), including the famous serpent Ouroboros who eats his tail, captioned ἐν τὸ πᾶν (“All is one”).⁹⁸ In the upper left quarter of the page is a diagram made up of two concentric rings of text surrounding a circular space in which three symbols are drawn: (1) a left-facing crescent (= quicksilver),⁹⁹ (2) a right-facing crescent with a small epsilon attached, and (3) the symbol for “gold” (also “sun”).¹⁰⁰ As Mertens points out, although Cleopatra’s name is here attached to these alchemical diagrams

96 Mertens treats fols. 112^r–115^r (i.e., the two “missing” texts with rubricated headings) as the continuation of the treatise; see *Les alch. gr.* 4.1 Mertens, xxvi–xxvii.

97 **M** 112^v₆: ταύτην τὴν τοῦ ὀργάνου διαγραφὴν.

98 This page is reproduced in black-and-white in *Les alch. gr.* 4.1 Mertens, 241, pl. 2.

99 Ὑδράργυρος; defined at **M** 6^v₁₀; see Bidez, *CMAG*, 8: no. 49.

100 Χρυσός/ἥλιος χρυσός: a circle with two tangent line segments that meet above and to the right of the circle; defined on fol. 6^r; see *ibid.*, 8: no. 1.

and the short text within the concentric rings, the diagrams actually appear to be closely related to Zosimos's works: this page of diagrams comes between two texts by Zosimos clearly attributed to him in *M*; the content of the diagrams seems unrelated to any of the extant Cleopatra material, but is quite suitable to Zosimos's works; and other manuscripts containing these same diagrams omit the Cleopatra caption.¹⁰¹ We may further note that when Stephen of Alexandria quotes the aphorism ἐν τὸ πᾶν, he ascribes it to a masculine philosopher (ὁ φιλόσοφος).¹⁰²

In short, of the texts that Letrouit says are missing from the table of contents, none is difficult to reconcile with the hypothesis that the table of contents reflects *M*'s original order.

What to Do with Quire 0

The fact that quire 0 has been so manipulated over the centuries raises the question of whether the folios that are original to that quire (fols. 2, 5, 6, 7) are today arranged in their original order. Letrouit argued in a 1995 article that since fol. 8 contains a decorative gate motif and Bessarion's pressmark (τόπος π', "80th locus") appears on it, fol. 8 was originally the first folio of the manuscript and quire 0 was originally at the end of the manuscript.¹⁰³ Letrouit does not say there when quire 0 in this scenario would have been moved to the beginning of the manuscript, but the implication must be that it was after Bessarion had given it a pressmark.

This hypothesis seems unnecessarily elaborate.¹⁰⁴ Middle Byzantine manuscripts frequently begin with a table of contents. The *Palatine Anthology* (tenth century, first half), a comparable compilation effort, begins with a table of contents for the entire volume,¹⁰⁵ while

each text of the middle Byzantine Dionysian Corpus manuscripts (*Divine Names*, *Celestial Hierarchy*, and so on) is usually preceded by its own table of contents.¹⁰⁶ Nor is the other prefatory material in quire 0 unusual. The list of signs that introduces the reader to what is necessary to read the texts that follow plays an analogous role to the glossary of technical terms with which Dionysian Corpus manuscripts often begin and is thus an entirely reasonable way to open the volume.¹⁰⁷ Nor need the dedicatory verses on fol. 5^v be shunted to the end: epigrams, while often appearing in colophons, were also a standard way to preface a Byzantine book.¹⁰⁸ In all this prefatory material, the list of alchemical authors on fol. 7^v—yet another way to orient the reader—does not seem out of place.

Nevertheless, quire 0 reconstructed as fols. 2, 5, 6, 7 does seem a bit oddly arranged. After its table of contents (fol. 2^{r-v})—which one might expect right before the beginning of the text—it contains an originally blank page (fol. 5^r) on the back of which is the dedicatory epigram (fol. 5^v), facing the beginning of the list of signs (6^{r-7^v}). At the end of this list, the list of authors appears, followed abruptly, on the facing page, by the work of Stephen of Alexandria (fig. 3). The pattern of decoration does not quite seem to work either: the table of contents opens with a thin golden bar outlined in red and a one-line golden heading; the list of signs has a thicker golden bar, also outlined in red, followed by

of the date and stages of composition, see Lauxtermann, *Byzantine Poetry*, 83.

106 This observation is based on a detailed examination of a number of tenth- and eleventh-century Dionysian Corpus manuscripts in the Greek National Library in Athens, the Vatican Library, and the Biblioteca Marciana in Venice, carried out in the spring and summer of 2014.

107 One might object that *M* contains, in addition to the list of signs in quire 0, an alphabetized glossary of terms (fols. 131^{r-22}–136^{v-3}) in quires 16 and 17 (originally the last two quires, according to Saffrey's reconstruction). This is indeed more comparable to the Dionysian Corpus glossaries, which are also alphabetized, but in terms of the construction of a book, the list of alchemical signs and the Dionysian Corpus glossary play a similar role: both present to the reader the specialized jargon—whether signs or neologisms/coinages—that will make the following corpus of texts more comprehensible.

108 For a range of eleventh-century examples (though the practice has much earlier origins), see K. Bentein and K. Demoen, "The Reader in Eleventh-Century Book Epigrams," in Bernard and Demoen, *Poetry and Its Contexts*, 69–88. Middle Byzantine Dionysian Corpus manuscripts often contain a standard set of epigrams at the beginning and end of each of the corpus's texts.

101 *Les alch. gr.* 4.1 Mertens, 176–77.

102 Stephen of Alexandria, *Lecture 4*, ed. Ideler, 214₁₅.

103 Letrouit, "Chronologie," 14. For such pressmarks, see Labowsky, *Bessarion's Library*, 20–21.

104 Letrouit later adopted the position that quire 0 could reasonably be placed at either the beginning or the end of the manuscript ("Hermétisme et alchimie," 87). It nevertheless seems worth considering why a reconstruction that transposes quire 0 to the back of the manuscript is unnecessary—and probably incorrect.

105 Fol. i^r; reprod. in K. Preisendanz, ed., *Anthologia Palatina: Codex Palatinus et Codex Parisinus phototypice editi*, 2 vols., continuous pagination (Leiden, 1911), xlv and A^r. On the manuscript and its scribes, see Cameron, *Greek Anthology*. For a summary discussion

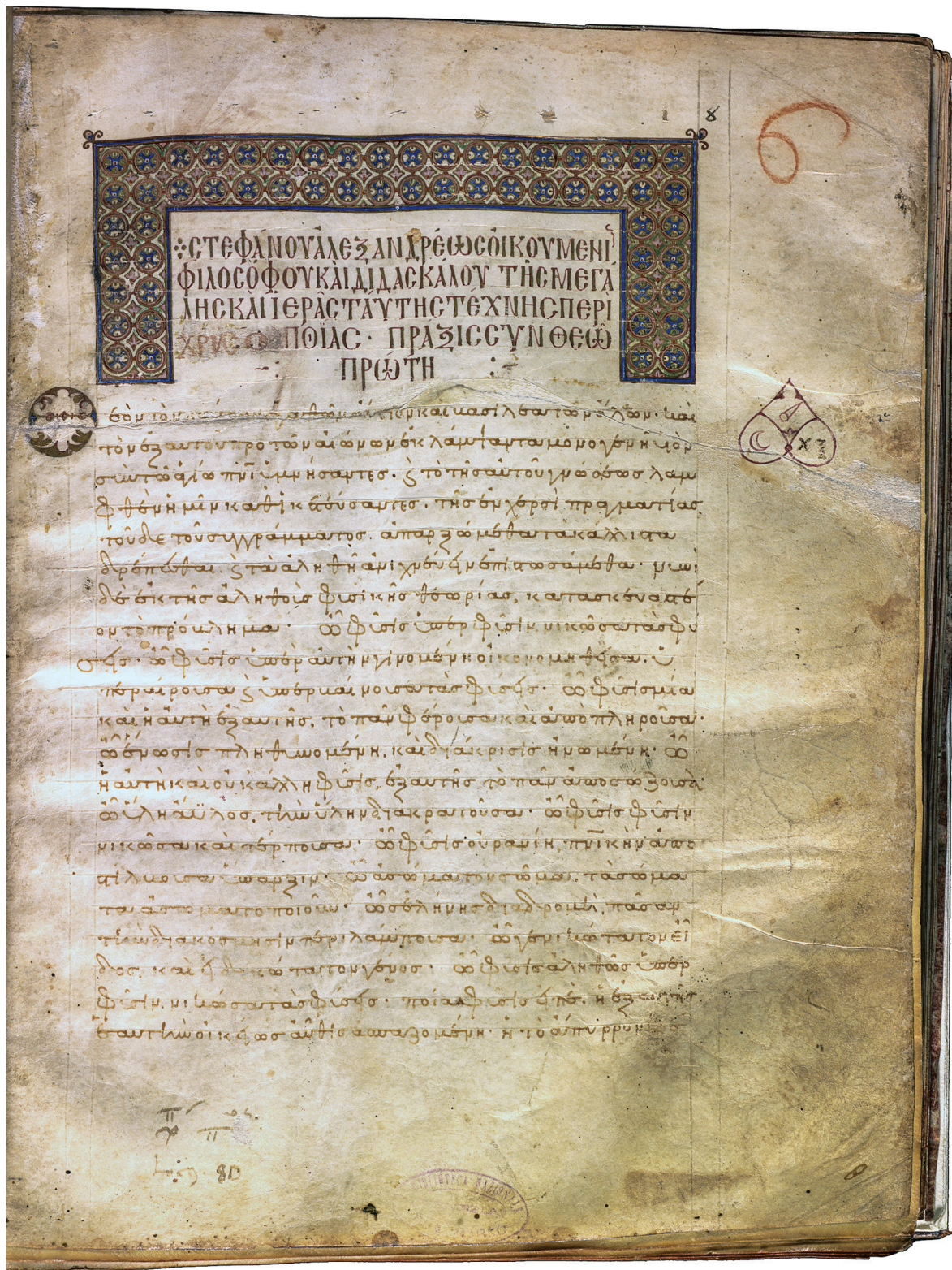


Fig. 3. Venice, Biblioteca Nazionale Marciana, gr. 299, fol. 8^r: the beginning of Stephen of Alexandria's *Lectures*. Reproduced with permission of the Ministero per i Beni e le Attività Culturali, Biblioteca Nazionale Marciana.

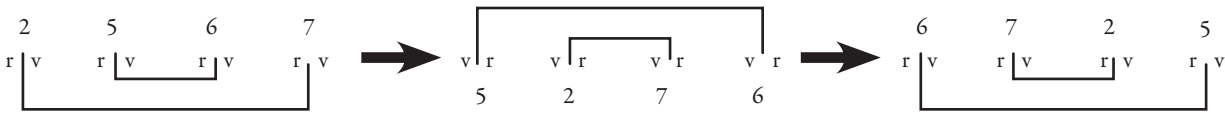


Fig. 4. Diagram of my hypothetical reconstruction of a possible original configuration of Venice, Biblioteca Nazionale Marciana, gr. 299, quire 0.

a three-line golden heading. Stephen of Alexandria's works then begin on the most elaborately decorated folio of the manuscript, with its fine gold, blue, and red gateway and its heading in careful, archaizing uncials written in golden ink. The quire may well have been a ternion or quaternion to begin with, so that one or two extra folios (blank, ornamented, or otherwise) might have appeared on either side of these four folios, but the overall order seems problematic.

I therefore tentatively propose a reordering of quire 0, namely, inverting the crease on fols. 2, 5, 6, 7 to produce the new order: 6, 7, 2, 5 (see fig. 4). (Rectos in today's order are still rectos in this reconstruction.) The first page (possibly after one or two additional folios, as just mentioned) is now the list of signs, headed by a thick golden bar outlined in red and an elaborate heading (fol. 6^r). This list is followed by the list of alchemical authors, then (jumping to fol. 2) the table of contents (headed by a thinner golden bar outlined in red and a more modest one-line heading). Facing the end of the table of contents (fol. 2^v) is a blank page (fol. 5^r). The page may have been left blank because a longer table of contents was expected,¹⁰⁹ or perhaps because it had been intended to hold an illustration or illumination of some sort. Finally comes the dedicatory epigram (fol. 5^v), which in this reconstruction, had quire 0 been originally a binion (4 folios), would have faced the beginning of the corpus and the grand gate on fol. 8^r. I stress that this reconstruction is tentative,¹¹⁰ but it does have the advantages of placing the dedicatory poem in a

more prominent position, having the table of contents closer to the beginning of the corpus proper, and situating the quire's most elaborate ornamentation (the thicker bar at the head of the list of signs) and heading at the beginning of (or at least earlier in) the quire.

2. An Alchemical Collection

Now that Saffrey's reconstruction of the manuscript's original configuration, with minor modifications, has been more firmly established, we may turn to interpreting that original configuration and situating it within middle Byzantine book culture. To do that we must first address how best to characterize middle Byzantine book culture itself.

Ever since Lemerle argued that middle Byzantine and especially tenth-century Byzantine culture was characterized by "encyclopædism," Byzantinists have grappled with his thesis.¹¹¹ Several recent volumes and articles attest to the field's enduring interest in applying, revising, and critiquing it, often in dialogue with other fields, especially the medieval and early modern history of Western Europe.¹¹² The most sustained critique has come from Paolo Odorico, who in a series of articles has argued that the term "encyclopædism," as used by Lemerle and those who have, albeit cautiously, adopted his terminology, is fundamentally flawed and

109 The last page of the table of contents contains thirty lines, whereas most pages in the codex, including the first page of the table of contents, have twenty-nine. This suggests that a decision was made not to begin a new page for the table of content's final line but rather to add an extra line below line 29.

110 Indeed, it should probably be modified to reflect the fact that quaternions are the rule in Byzantine manuscripts, such that it seems quite likely that there were four more folios in the quire. The rearrangement of the order proposed here (even if there were other folios in addition) nevertheless has some plausibility.

111 Lemerle, *Premier*, chap. 10.

112 Van Deun and Macé, *Encyclopedic Trends*; J. König and G. Woolf, eds., *Encyclopaedism from Antiquity to the Renaissance* (Cambridge, 2013), especially chaps. 10–12 by Paul Magdalino, András Németh, and Erika Gielen respectively; and B. Flusin and J.-C. Cheynet, eds., "Autour du *Premier humanisme byzantin* et des *Cinq études sur le XI^e siècle*, quarante ans après Paul Lemerle," *TM* 21.2 (2017). For these references, I am grateful to an anonymous reviewer, whose remarks were the impetus for the present section. See also C. Holmes, "Byzantine Political Culture and Compilation Literature in the Tenth and Eleventh Centuries: Some Preliminary Inquiries," *DOP* 64 (2010): 55–80.

misleading because it (1) misrepresents the character of the works in question; (2) obscures a continuity that goes back at least to late antiquity; and (3) risks lumping together texts that differ dramatically not only in their form and purpose but also in how they use earlier sources (e.g., excerpting versus drawing on or adapting). Instead, Odorico proposes that by paying attention to the vocabulary used to describe such works by Greek-speaking scholars themselves, we may retrieve the much more appropriate term “collection” (συλλογή).¹¹³ This allows him to argue that Greek scholarship and book culture were characterized throughout the first millennium CE by a “cultura della συλλογή”—a “culture of the collection” or “florilegic culture.”¹¹⁴ Through this lens, he further argues that pagan doxography, Christian dogmatic florilegia, questions-and-answers, and so on are all part of this florilegic culture, as are the works Lemerle discusses (works of Constantine VII Porphyrogenetos like the *Historical Excerpts*; the *Taktika*, *Geponika*, *Iatrika*, *Hippiatrika*, *Etymologika*, *Souda*, and the *Menologion* of Symeon Metaphrastes; and legal and literary collections like the *Basilika* and anthologies of epigrams).¹¹⁵ In Odorico’s approach to this tradition, the question becomes not whether a collection is “encyclopedic” but rather (1) how it uses its sources (reproducing complete texts, or excerpting, paraphrasing, or otherwise adapting sources) and (2) how and according to what criteria it reassembles the result of the first step. Thus, we may distinguish

between a text-collection (made up of whole texts) and an excerpt-collection.¹¹⁶ For example, the *Menologion* of Symeon Metaphrastes, like the *Historical Excerpts*, is a collection whose organization (second criterion) follows its own logic (the liturgical year, just as the *Historical Excerpts* are arranged according to the lessons to be learned from each excerpt), but the *Menologion*’s approach to its sources (first criterion) has nothing to do with that of the *Historical Excerpts* (rewriting pre-existing saints’ lives in a higher and uniform linguistic register rather than reproducing excerpts from the sources verbatim).¹¹⁷

What, then, is distinctive about middle Byzantine cultural production? In response to Odorico, Magdalino has proposed that while florilegia and a florilegic culture had indeed existed for centuries, there is still something special about the corpus of tenth-century texts treated by Lemerle, namely, (1) imperial involvement, (2) the incorporation of more recent material in compilations, (3) more “explicitly historical, antique or antiquated [material],” and (4) subject matter that is often unparalleled among compilations (that survive) from other centuries.¹¹⁸ This proposal merits further exploration.¹¹⁹ The last point especially seems a plausible way to recover some of what Lemerle may have been getting at with his argument that the tenth century was characterized by encyclopedism: even if excerpting and collecting had continued throughout the eighth and ninth centuries (e.g., in legal compilations), perhaps

113 P. Odorico, “La cultura della συλλογή: 1) Il cosiddetto enciclopedismo bizantino, 2) Le tavole del sapere di Giovanni Damasceno,” *BZ* 83.1 (1990): 1–21; idem, “Cadre d’exposition / cadre de pensée: La culture du recueil,” in Van Deun and Macé, *Encyclopedic Trends*, 88–107; idem, “Du premier humanisme à l’encyclopédisme: Une construction à revoir,” *TM* 21.2 (2017): 23–43. Part of Odorico’s objection to using the term “encyclopedic” is that calling something an encyclopedia either conjures up the early modern project of a widely circulating printed guide to all human knowledge or the more recent genre of encyclopedias on a given topic that use a system of cross-references to allow the reader to start with one entry and navigate to other entries depending on interest (for the latter, Odorico invokes Wikipedia in particular): Odorico, “Cadre,” 89; Odorico, “Du premier,” 37–38.

114 I borrow this translation from P. Magdalino, “Orthodoxy and History in Tenth-Century Byzantine ‘Encyclopedism,’” in Van Deun and Macé, *Encyclopedic Trends*, 143–59, at 143: “florilegic habit.” I prefer “culture” to “habit” in translating Odorico’s term because “culture” connotes more self-conscious and purposeful, rather than reflexive, activity.

115 Odorico, “Cadre”; Odorico, “Du premier,” 27–28.

116 This is my terminology. Odorico’s term for text-collection is “anthology” (which brings together whole texts as, for example, the *Palatine Anthology*, which gathers epigrams without “disassembling” them, or the *Novels* of the *Basilika*), and his term for excerpt-collection is συλλογή (a collection of nonintegral excerpts of integral texts, which have thus been “disassembled” prior to reassembly): Odorico, “Du premier,” 27.

117 Ibid.

118 Magdalino, “Orthodoxy and History.”

119 The degree of uniqueness of these features to tenth-century texts could be further scrutinized. One could perhaps come up with counterexamples (e.g., legal compilations under Theodosios and Justinian were certainly characterized by imperial involvement; the poetry anthologies upon which the *Palatine Anthology* is based certainly included material that was relatively close to them in time; philosophical doxographies quoted pre-Socratic philosophers, though perhaps these opinions were more ancient than antiquated—still, are we sure that the material in, say, the *Historical Excerpts* was seen as antiquated rather than simply ancient?), but without a systematic study of published and unpublished texts it is unclear how anomalous such counterexamples are.

these scholarly approaches (and the imperial patronage supporting them) were now directed toward a wider range of intellectual and literary spheres. Still, it is hard to escape Odorico's view that these works were not fundamentally novel in their form or method of composition, but were instead part of a longstanding florilegic culture—an appreciation for and widespread deployment of the method and genre of excerpting and collecting—that flourished in Byzantine scholarly circles at least until the twelfth century.¹²⁰

Can we go further, reconciling Odorico's critique with Lemerle's intuition that there was indeed something particularly "encyclopedic" about tenth-century scholarly culture? We should begin by offering a definition of "encyclopedic" that is distinct from florilegic (thus addressing Odorico's critique that Lemerle conflates the two, saying "encyclopedic" when he means nothing more than florilegic) but at the same time acknowledges the Byzantinist's impression that there was something different about the compilations produced in the tenth century. Let us say that something is florilegic when it is *characterized by the use or appreciation of excerpting and compilation in the production of a text that arranges old material in a new, coherent way*,¹²¹ and let us say that something is encyclopedic if (and only if) it is *characterized by a systematizing, universalizing, synoptic approach to knowledge, especially knowledge of particulars*, that is to say, *historia* (information about the world and human activity in the world) and *technē* (how humans can manipulate the world), rather than *epistēmē* (knowledge derived from first principles). This definition shifts from thinking about "encyclopedic" as a term describing in the first place a literary genre called the encyclopedia—whether one means by that modern reference works like the *Encyclopaedia of Islam*, the *Oxford Dictionary of Byzantium*, and Wikipedia or, alternatively, the early modern, all-embracing synthesis of all knowledge in a single multivolume work like Diderot's *Encyclopédie* (1751–1772).¹²² Instead, this

definition allows one to speak of "encyclopedic" without encyclopedias and so may perhaps add precision to the way scholars already talk about the tenth century: as an encyclopedic age. If we follow Odorico in tracing a long history of florilegic culture, and in rejecting (or at least hesitating to embrace) Lemerle's application of the label "encyclopedia" to most tenth-century compilations, we may nevertheless see the application of florilegic methodology to many domains of knowledge as reflecting an *encyclopedic* spirit. In other words, perhaps tenth-century scholarly culture was encyclopedic even though it may have produced few works that are encyclopedias in the modern sense of an alphabetically-arranged (or electronic) reference work with cross-references.¹²³ For, as has been often observed, tenth-century florilegic culture embraced not only law, dogma, and biblical exegesis as in previous centuries but also practical ethics as extracted from historical narratives (the *Historical Excerpts*), imperial practice (*De administrando imperio*, *De cerimoniis*, *De thematibus*), technical arts (*Geoponika*, *Iatrika*, *Hippiatrika*, *Taktikon*), and poetry (the *Palatine Anthology*). Some of these continued or revived old florilegic practices,¹²⁴ but the converging use of florilegia for so many fields of learning and literature suggests that the tenth century was encyclopedic in the sense I have proposed. This is still a hypothesis, a restatement of Lemerle's hypothesis, but one that might better lend itself to being evaluated based on the evidence.

What sort of collection, then, was **M**, and how does it relate to Byzantine book culture in the age when it was produced? To answer these questions I will review **M**'s reconstructed contents as established above in §1 and

120 In Odorico's view, florilegic culture began to be less pronounced in the twelfth century: Odorico, "Cadre," 106. Still, a perusal of the volume in which he published this suggestion (Van Deun and Macé, *Encyclopedic Trends*) gives reason to believe that collecting and compiling was an important mode of scholarly production in the late Byzantine period as well.

121 Odorico, "Du premier," 25–26.

122 Many have addressed the tension between these two (and other) definitions of "encyclopedia." For example, see P. van Deun and

C. Macé, "Encyclopedic Trends in Byzantium? An Introduction," in eadem, *Encyclopedic Trends*, xv–xvii; P. Schreiner, "Die enzyklopädische Idee in Byzanz," in *ibid.*, 3–25; J. König and G. Woolf, "Introduction," chap. 1 in eadem, *Encyclopaedism*, 1–20, esp. 2–3 (where particular early modern encyclopedias are discussed); Odorico, "Du premier," 28. The definition of "encyclopedic" (as opposed to "encyclopedia") that I offer draws on the ideas expressed by these and other scholars.

123 The *Σοῦδα* (*Souda*) being a notable exception, since it was very much a reference work, arranged alphabetically (according to an order of the alphabet that placed homophonous vowels and digraphs together).

124 For example, anthologies of epigrams produced from the first century BCE to the sixth century CE were the basis for two major poetry anthologies of the tenth century: the anthology of Kephala and, largely based on it, the *Palatine Anthology*; Cameron, *Greek Anthology*, 1–16.

seek to characterize the manuscript's florilegic method and approach to knowledge. I will then conclude the article by comparing its method and approach with contemporary products of Byzantine scholarly activity.

Collected Texts and Excerpts

M's table of contents lists fifty-two texts, unnumbered in the manuscript (figs. 5–6). For each item in the following list I note the (ascribed) author, an English translation of the title, the Greek title and attribution as it appears in the table of contents, and the folios of M where the corresponding text is to be found.¹²⁵ The two lacunas are indicated below.

1. Stephen of Alexandria, *On the Great and Sacred Art of Making Gold*, [Lecture 1]: Στεφάνου Ἀλεξανδρέως οἰκουμενικοῦ φιλοσόφου Περὶ τῆς ἱερᾶς καὶ θείας τέχνης τῆς τοῦ χρυσοῦ ποιήσεως (8^r–10^r).
2. Stephen of Alexandria, *Lecture 2*: τοῦ αὐτοῦ πράξις [sic] δευτέρα (10^r–13^v).
3. Stephen of Alexandria, *Letter to Theodore*: τοῦ αὐτοῦ Ἐπιστολὴ πρὸς Θεόδωρον (13^v–14^r).
4. Stephen of Alexandria, *Lecture 3, On the Material World*: τοῦ αὐτοῦ Περὶ τοῦ ἐνύλου [sic] κόσμου, πράξις τρίτη (14^r–16^v).
5. Stephen of Alexandria, *Lecture 4, On [the Book] Concerning Action*: τοῦ αὐτοῦ Εἰς τὸ Κατ' ἐνέργειαν, πράξις [sic] τετάρτη (16^v–20^v).¹²⁶
6. Stephen of Alexandria, *Lecture 5*, likewise: τοῦ αὐτοῦ ὁμοίως, πράξις [sic] ε' (20^v–23^v).
7. Stephen of Alexandria, *Lecture 6*: τοῦ αὐτοῦ φιλοσόφου πράξις [sic] ς' (23^v–28^v).
8. Stephen of Alexandria, *Lecture 7*: τοῦ αὐτοῦ πράξις [sic] ζ' (29^r–33^r).
9. Stephen of Alexandria, *Lecture 8, On the the Division of the Sacred Art*: τοῦ αὐτοῦ Περὶ τομῆς τῆς ἱερᾶς τέχνης, πράξις [sic] η' (33^r–36^v).
10. Stephen of Alexandria, *Lecture 9, Lesson [addressed] to the Emperor Heraclius*: τοῦ αὐτοῦ Διδασκαλ(ί)α πρὸς Ἡρακλειο(ν) [sic] τὸν βασιλ(έ)α, πράξις [sic] θ' (36^v–39^v; end missing).

125 M's table of contents is transcribed in Bidez, *CMAG*, 2:20–22. For the list of titles, followed by a clear visualization of Saffrey's reconstruction of how the table of contents fits the manuscript's actual contents, including the lacunas, see *Les alch. gr. 4.1* Mertens, xxiv–xxvii.

126 Cf. no. 33, Olympiodoros's commentary on Zosimos's book *Concerning Action*.

Lacuna: nos. 11–16 are missing from the manuscript entirely because they were originally contained in quires that are now lost; they are thus listed here without folio numbers.

11. Heraclius, *On Chemistry, to Modestus, Patriarch of the Holy City* [Jerusalem]: Ἡρακλείου βασιλ(έως) Περὶ χίμης πρ(ὸς) Μόδεστον ἱεράρχ(ην) τῆς Ἀγίας Πό(λεως).
12. Heraclius, *Eleven Chapters on Making Gold*: τοῦ αὐτοῦ Ἡρακλείου Κεφάλ(αι)α περὶ τῆς τοῦ χρυσοῦ ποιήσεως(ς) ια'.
13. Heraclius, *Meeting about the Philosophers' Quest for the Sacret Art*: τοῦ αὐτοῦ Ἡρακλ(είου) Σύλλογος περὶ τῆς τῶ(ν) φιλο(σόφων) ἐπιζητήσεως τῆς ἱερᾶς ταύτης τέχνης.
14. Justinian, *A Letter*: Ἰουστινιανοῦ βασιλέως Ἐπιστολὴ.
15. Justinian, *Five Chapters on the Divine Art, and Discourse to the Philosophers*: τοῦ αὐτοῦ Ἰουστινιανοῦ Κεφάλαια ε' περὶ τῆς θείας τέχ(νης) καὶ διάλεξις πρὸς τοὺς φιλοσόφους.
16. Komerios [read: Komarios?], *Discourse to Cleopatra*: Κομερίου φιλοσόφου Διάλεξις πρὸς Κλεοπάτραν.

The manuscript resumes with the end of no. 17:

17. *Dialogue of Philosophers and Cleopatra*: Διάλογος φιλοσόφων καὶ Κλεοπάτρας (40^r–43^v; beginning missing).¹²⁷
18. Heliodoros, *To Emperor Theodosios, On This Divine Art*, in iambic verse: Ἡλιοδώρου φιλοσόφου Πρὸς Θεοδόσιον τὸν βασιλέα / Περὶ τῆς θείας ταύτης τέχνης, διὰ στίχ(ων) ἱάμβων (43^v–48^r).¹²⁸
19. Theophrastos, *On the Same Art*, likewise in verse: Θεοφράστου φιλοσόφου Περὶ τ(ῆ)ς αὐτ(ῆ)ς τέχ(ν)ης ὁμοίως δι(ὰ) στίχων (48^v–53^r).
20. Hierotheos, *On the Same Divine Art*, in verse: Ἱεροθέου φιλοσόφου Περὶ τ(ῆ)ς αὐτ(ῆ)ς θείας τέχ(ν)ης, διὰ στίχων (53^r–57^r).
21. Archelaos, *On This Divine and Sacred Art*, in verse: Ἀρχελάου φιλοσόφου Περὶ τ(ῆ)ς θείας ταύτ(ης) κ(αὶ) ἱερᾶς [sic] τέχ(νης), διὰ [sic] στίχων (57^r–62^v).

127 For the problems with this text and the manuscript tradition of which M is a part, see below.

128 In the table of contents, the part of the (Greek) title after the slash appears on a new line, not indented, as if it were a new item. The end of the previous line is punctuated as if this were indeed the case.

22. Pelagios, *On Making Gold*: Πελαγίου φιλοσόφου Πε(ρι) χρυσοποιίας (62^v–66^r).
 23. Ostanēs, *To Petasios on the Same Sacred Art*: Ὀστάνου φιλοσόφου πρ(ὸς) Πετάσιον Πε(ρι) τ(ῆς) αὐτ(ῆς) ἱερᾶς τέχνης (66^{r-v}).
 24. Democritus, *On Making Purple and Gold, Physics and Arcana*: Δημοκρίτ(ο)υ Πε(ρι) πορφύρ(α)ς κ(αί) χρυσοῦ ποιήσεω(ς), Φυσικά κ(αί) μυστικά (66^v–71^r).¹²⁹
 25. Democritus, *On Making Silver*: τοῦ αὐτοῦ Πε(ρι) ἀσήμου ποιήσεως (71^r–72^v).
 26. Synesios, *Discourse to Dioskoros on the Divine Democritus's Book*: Συνεσίου φιλοσόφου πρὸς Διόσκορον Διάλεξις πε(ρι) τῆς τοῦ θείου Δημοκρίτου βίβλου (72^v–78^r).
 27. Anonymous Philosopher, *On Divine Water*: Ἀνεπιγράφου φιλοσόφου Πε(ρι) θείου ὕδατος (78^r–79^r).
 28. Anonymous Philosopher, *On Making Gold*: τοῦ αὐτοῦ Πε(ρι) χρυσοποιίας (79^r–92^v).
 29. Zosimos, *On Excellence*: Ζωσίμου Πανοπολίτου Πε(ρι) ἀρετῆς (92^v–95^v).
 30. Agathodaimon, *A Chapter*: Ἀγαθοδαίμονος Κεφάλαιον (95^v).
 31. Hermes, Zosimos, Neilos, and Africanus, *Chapters*: Ἑρμοῦ, Ζωσίμου, Νείλου<, > Ἀφρικανοῦ Κεφάλαια (95^v; all but first chapter missing).
- Lacuna: folios containing the rest of no. 31 and the beginning of no. 32 are now lost.
32. Zosimos, *Thirty-Five Chapters to Eusebeia*: Ζωσίμου φιλοσόφου πρὸς Εὐσέβειαν Πε(ρι) τῆς ἱερᾶς καὶ θείας τέχνης κεφάλαια λε' (141^r–163^r; beginning missing).
 33. Olympiodoros, *On Zosimos's Concerning Action*: Ὀλυμπιόδωρου φιλοσόφου Εἰς τ(ὸ) Κατ' ἐνέργειαν Ζωσίμου (163^r–179^r).¹³⁰
 34. Zosimos, *Fifteen Chapters to Theodore*: Ζωσίμου πρὸς Θεόδωρον Κεφάλαια ιε' (179^r–180^v).
 35. Anonymous Philosopher, *On Making Gold*: Ἀνεπιγράφου φιλοσόφου Πε(ρι) χρυσοποιίας (181^r–184^v).
 36. Pappos, *On the Divine Art*: Πάππου φιλοσόφου Πε(ρι) τῆς θείας τέχνης (184^v–185^r).
 37. Moses, *On the Doubling of Gold*: Μωσέως Πε(ρι) διπλώσεως χρυσοῦ (185^r).
 38. Eugenios and Hierotheos, *Chapters*: Εὐγενίου καὶ Ἱεροθέου Κεφάλαια (185^r–186^r).
 39. Zosimos, *On Instruments and Furnaces*: Ζωσίμου Πε(ρι) ὀργάνων καὶ καμίνων (186^r–188^r).
 40. Zosimos, *On Divine Water*: τοῦ αὐτοῦ Πε(ρι) θείου ὕδατος (188^r).
 41. Zosimos, *On Instruments and Furnaces, Authentic Memoirs*: τοῦ αὐτοῦ Πε(ρι) ὀργάνων κ(αί) καμίνων γνήσια ὑπομνήματα (189^r–196^v, 112^r–118^r).
 42. *Dyeing, or Transformation of Fire-Copper into White-Copper*: Βαφή ἤτοι μεταβολὴ πυροχάλκου πρὸς ἀσπρόχαλκον (118^{r-v}).
 43. *Dyeing and Making Indian-Iron*: Βαφή καὶ ποιήσις τοῦ ἰνδικοῦ σιδήρου (118^v, 104^r).
 44. *Dyeing for Swords and Stone-Cutters' Tools*: Βαφή πρὸς ξίφη κ(αί) ἐργαλεῖα λαξευτικά (104^r₂–106^r).
 45. *On the Fabrication of Silver and Quicksilver and Cinnabar*: Πε(ρι) ἀσήμου κ(αί) ὕδραργύρου κ(αί) κινναβάρως ποιήσις [read ποιήσεως; cf. heading, fol. 106^r: Πε(ρι) ποιήσεως ἀσήμου] (106^r–108^r).
 46. *[Extracts] from Cleopatra's On Measures and Weights*: Ἐκ τῶν Κλεοπάτρας Πε(ρι) μέτρων καὶ σταθμῶν (108^v₁–110^r₅).
 47. The Christian, *On the Stability of Gold*: τοῦ Χριστιανοῦ Πε(ρι) εὐσταθείας τοῦ χρυσοῦ (110^r–111^v₂₉).¹³¹
 48. The Christian, *On Making Gold, Thirty Chapters*: τοῦ αὐτ(οῦ) Πε(ρι) χρυσοποιίας κεφάλαια λ' (96^r–101^r [?], 101^r–103^v₂₉, 119^r–128^v).¹³²
 49. *On Making Concave and Convex Dies* (i.e., for stamping coins): Πε(ρι) φούρμων καὶ τόλων ποιήσεως (128^v–130^r).¹³³

131 This text may continue on M 96^r–101^r; see n. 132.

132 The headings on M 96^r–101^r could be construed as part of no. 47 (rather than no. 48) since it is only on 101^r that a heading refers to the author again. On the other hand, including these folios as part of no. 48 makes the total number of “chapters” in no. 48 come to about thirty. See further below.

133 My translation of this title follows *CAAG*, 3:359, where the title as it appears in the heading of this text (M 128^v) is rendered “Si tu veux fabriquer des formes en creux et en relief avec du bronze” (εἰ θέλεις ποιῆσαι φούρμας καὶ τόλους ἀπὸ βροντησίου, ποίει οὕτως). In their edition of the text, Berthelot and Ruelle emend τόλους to τύλους (“lumps” or “knobs”). Similarly, Mertens translates the title as it appears in the table of contents as “Sur la fabrication des formes et des empreintes”; *Les alch. gr.* 4.1 Mertens, xxv. The text itself makes clear that the “form” or “mold” in question is a die for stamping coins. See now Merianos, “Alchemy,” 249.

129 This work is often referred to by its Latin transcription, *Physica et mystica*, or by the translation *Natural and Divine* [sc. *Questions*]; ps.-Dem. Martelli Engl., 1. Cf. *CAAG*, 3:43. I find that “arcana” captures the sense and connotations of μυστικά. This is how Matthaeus Zuber (1570–1623) translated the title (*Naturalia et arcana*); see ps.-Dem. Martelli Engl., 5, 188.

130 Cf. no. 5.

50. *On the Variety of Lead and On Gold Leaf*: Πε(ρι) διαφορᾶς μολιβδου κ(αι) πε(ρι) χρυσοπετάλων (130^r–131^r).
51. *Alphabetical Lexicon of Gold-Making*: Λεξικὸν καταστοιχεῖον τῆς χρυσοποιᾶς (131^r–136^v).
52. *Other Chapters by Different Makers, On Making Gold*: ἕτερα κεφάλ(αι)α διαφόρων ποιητῶ(ν) περ(ι) χρυσοποιᾶς (136^v–138^r).

After no. 52 (or perhaps continuing it), one more text (not listed in the table of contents) appears:

Extracts (via Photios, *Bibliotheca*) from Agatharchides' lost work *On the Red Sea*.¹³⁴

From this table of contents we can see that the original manuscript assembled both integral texts (such as the *Lectures* of Stephen of Alexandria) and excerpts, usually labeled as “chapters” or “headings” (κεφάλαια), which in Byzantine literary culture generally indicated a selection of excerpts arranged under headings (nos. 12, 15, 30–32, 34, 38, 48, 52).¹³⁵ One (no. 46) is marked out as a selection of one or more excerpts by its title, *From Cleopatra's On Measures and Weights* (Ἐκ τῶν Κλεοπάτρας Περὶ μέτρων καὶ σταθμῶν).¹³⁶ The final text, by Agatharchides and not mentioned in the table of contents (though perhaps it should be construed as part of no. 52),¹³⁷ is an excerpt as well.¹³⁸ Since the abundant presence of integral texts (and many more long portions of integral texts) is evident not only from their titles in the table of contents but also from the editions of these texts that have so far been published,

a survey of the texts marked as excerpts will suffice to demonstrate M's character as a collection weaving together texts and excerpts in a single volume.

Of the items marked out as excerpts, two (nos. 12 and 15, attributed to Heraclius and Justinian) are not extant. The others we may verify by looking at the manuscript, beginning with those labeled “chapters.” No. 30 is indeed a brief excerpt of one and a half lines—a single sentence—attributed to Agathodaimon. Its first letter is a larger marginal initial. This “chapter” moves seamlessly into the next (the first and only extant “chapter” of no. 31), attributed to Hermes. This excerpt is almost two lines long. The attribution to Hermes appears at the end of the second line of Agathodaimon's “chapter,” which precedes it. Each of these two excerpts is a single gnomic sentence. Before the manuscript lost its next quire, these two were followed by “chapters” of Zosimos, Neilos, and Africanus, presumably similarly short.

Next we have two sets of chapters excerpted from Zosimos's works (nos. 32, 34). Mertens describes no. 32 (Zosimos, *Thirty-Five Chapters to Eusebeia*, whose beginning is missing but extant part is still quite long) as a “collection of extracts about various subjects” and containing many references to older authors, primarily pseudo-Democritus but also Hermes, Mary, and Agathodaimon. This collection, Mertens argues, was probably the work of an “epitomizer” who compiled extracts from works of Zosimos—and occasionally cited later authors such as Stephen of Alexandria.¹³⁹ As for no. 34 (Zosimos, *Fifteen Chapters to Theodore*), Mertens observes that it too consists of extracts (sixteen rather than fifteen), with titles added by the compiler; this original compilation, she hypothesizes, was later redacted by someone who omitted some of the extracts (i.e., the quotations from Zosimos), in those cases leaving only the compiler's titles. The result is a mix of excerpts from and content summaries of Zosimos's original works.¹⁴⁰ The compiler's titles are not formatted in M as headings but rather as part of the main body of text, always beginning with “Concerning” (περὶ), whose first letter (π) extends toward the left

134 See n. 77 above.

135 For monastic literature, see P. Géhin, “Les collections de *Kephalaia* monastiques: Naissance et succès d'un genre entre création, plagiat et florilège,” in *Theologica minora: The Minor Genres of Byzantine Theological Literature*, ed. A. Rigo, P. Ermilov, and M. Trizio (Turnhout, 2013), 1–50; J. Kalvesmaki, “Evagrius in the Byzantine Genre of Chapters,” chap. 10 in *Evagrius and His Legacy*, ed. J. Kalvesmaki and R. D. Young (Notre Dame, IN, 2016), 257–87.

136 The phrasing suggests that the selection in the manuscript is from a pre-existing collection of excerpts entitled *On Measures and Weights*.

137 See p. 99 and n. 179, below.

138 No. 13, at least as listed in the table of contents, is labeled a “meeting” or “assembly” (*syllogos*), but this could be a scribal error for “collection” (*syllogē*). On the other hand, because it involved an emperor, this lost text may well have been framed as a dialogue between the emperor and scholars at court.

139 *Les alch. gr. 4.1* Mertens, lx and n. 168. The two references to Stephen of Alexandria are at M 147^r₂₉–147^v₅ (*CAAG*, 2:162_{19–24}) and M 151^v_{3–7} (*CAAG*, 2:173_{1–5}). It may be that they were not the work of the compiler but rather marginal notes on an earlier copy of this compilation that were then incorporated into the text.

140 *Les alch. gr. 4.1* Mertens, lx–lxi, lxiii–lxv.

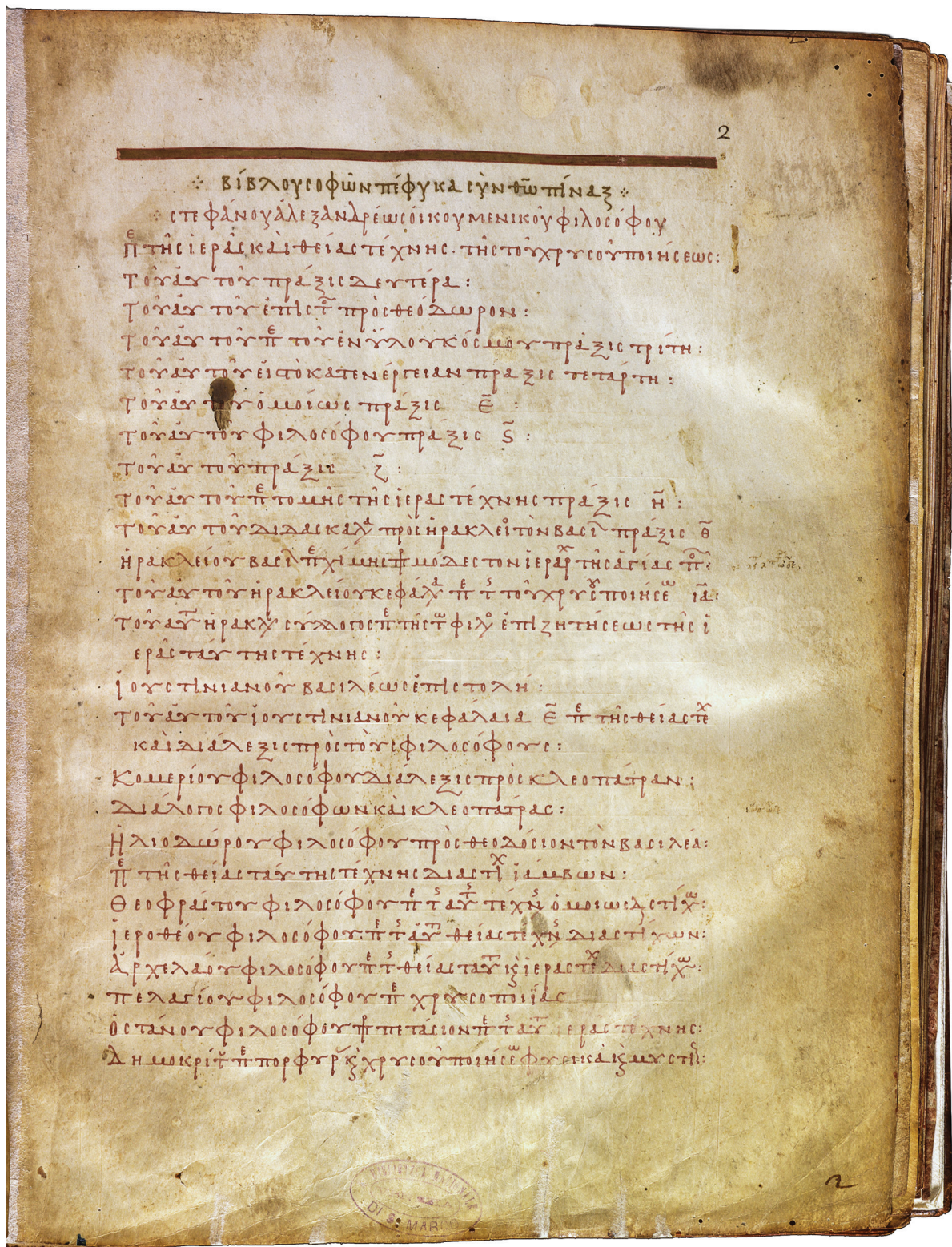


Fig. 5. Venice, Biblioteca Nazionale Marciana, gr. 299, fol. 2^r: table of contents, page 1 of 2. Reproduced with permission of the Ministero per i Beni e le Attività Culturali, Biblioteca Nazionale Marciana.

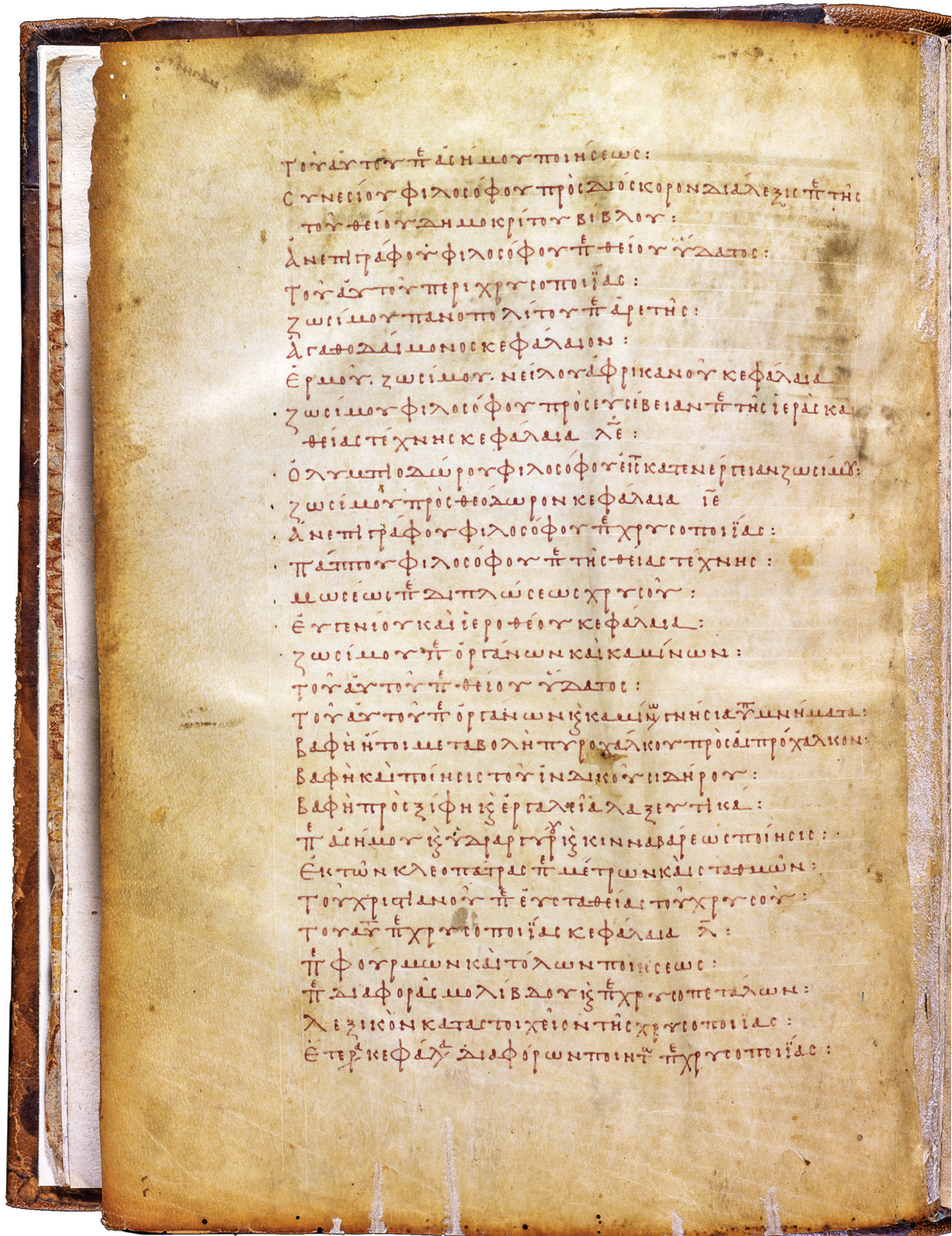


Fig. 6. Venice, Biblioteca Nazionale Marciana, gr. 299, fol. 2^v: table of contents, page 2 of 2. Reproduced with permission of the Ministero per i Beni e le Attività Culturali, Biblioteca Nazionale Marciana.

margin as a kind of (unadorned) initial. Thus, visually and in actuality, this text too is a collection of excerpts (and summaries) of the sources on which it draws (even if indirectly).

Item no. 38 (Eugenios and Hierotheos, *Chapters*) in fact represents two separate items in the manuscript. The first is a single chapter of five lines ascribed to Eugenios and labeled “ch(apter)” (κε for κεφάλαιον) beside the title. The text is a self-contained recipe; we should perhaps think of it as a very short but integral text of the sort that might circulate in various collections (like the epigrams in the *Palatine Anthology*) rather than as an excerpt from a larger text. The longer text of about one and a half pages that follows this recipe starting on the next page bears a heading that does not call it a chapter or excerpt: Hierotheos, *On the Sacred Art* (Ἱεροθέου Περὶ τῆς ἱερᾶς τέχνης).¹⁴¹ It begins with a metallurgical recipe, followed by a Christian discussion invoking Christ “Emmanuel.”¹⁴² The text ends with a Christian prayer. This may in fact be extracted from a larger work as suggested by the table of contents, but it is fairly self-contained and could simply be a short text included in the collection in its entirety.¹⁴³

Item no. 46 (*From Cleopatra’s On Measures and Weights*) is not labeled a “chapter” or “chapters.” The text begins with a brief explanation (about nine lines) of what it is, namely, an account of the quantitative relationships between different units of measurement. The rest of the text then does what it said it was going to do, unit by unit. Most of the proverbial “bullet points” in this list of relationships are marked by a hanging initial (unadorned) in the left margin; the end of each is indicated with a punctuation mark.¹⁴⁴ This

text may very well be extracts from a text that originally described these relationships in continuous prose rather than “bullet points.” Alternatively, or in addition, the original text might have included more relationships between units, that is, more “bullet points.” In this sense, then, it might be a small collection of excerpts or an extract from a larger work.

Much more like an excerpt-collection is the text corresponding to no. 48 in the table of contents (The Christian, *On Making Gold, Thirty Chapters*). This is one of two titles ascribed to “the Christian” (the other is no. 47). Together, the texts corresponding to these two titles straddle not one but two binding errors: as the manuscript is presently bound, the texts begin at the end of quire 13, continue (jumping back a quire) through all of quire 12, then continue (jumping forward several quires) through all of quire 15 and the beginning of quire 16. This has meant that the relationship between these two titles and how they fit together have been particularly little studied (especially relative to the works of Stephen of Alexandria, Zosimos, and pseudo-Democritus). Even in the manuscript’s original state, it seems there may have been some confusion about how they fit together. If one were to judge solely from how the texts and their headings appear in the manuscript, one might be inclined to group the two texts as follows: (a) no. 47 on 110^r–111^v, 96^r–101^r; and (b) no. 48 on 101^r–103^v, 119^r–128^v. This is because only two of the many headings that occur on these folios name the author: the first (τοῦ Χριστιανοῦ Περὶ εὐσταθείας τοῦ χρυσοῦ, 110^r) and the twelfth (τοῦ αὐτοῦ Χριστιανοῦ Περὶ τοῦ θεοῦ ὕδατος, 101^r_{16–19}). On the other hand, the table of contents specifies that no. 48 contains “thirty chapters”—much more than the number of sections that one finds following the second heading mentioning the author’s name on 101^r but almost exactly the number of sections if one begins counting at 96^r.¹⁴⁵

141 *CAAG*, pt. 6, no. 19.

142 The discussion begins: “Use this with the help of the life-giving Emmanuel, God’s Logos, radiance of the Holy Spirit” (τοῦτο χρῶ συννεργούντος Ἐμμανουὴλ τοῦ ζωαρχικοῦ, τοῦ θεοῦ λόγου, καὶ ἀπαύγασμα τοῦ ἁγίου πνεύματος, M 185^v_{19–21}). For χρᾶμαι with the accusative in later Greek, see LSJ, s.v. χρᾶω (B), C.VI, especially the medical recipe in P. Tebt. 273 (second/third century), line 28, in *The Tebtunis Papyri*, ed. B. P. Grenfell and A. S. Hunt, vol. 2 (London, 1907), 22.

143 The previous item, no. 37 (Moses, *On the Doubling of Gold*), is not explicitly called an excerpt but has the appearance of being one. It is only five lines long, much like the “chapter” of Eugenios, which appears just below it on the same page (no. 38, first part). Like Eugenios’s “chapter,” the short text is a self-contained recipe, an integral text.

144 After a very final looking mark on M 109^v (near the bottom), the text skips a line then continues with a few more quantitative

relationships. This last portion of the text also mentions the amount of silver used to bribe Judas and the number of years of hardship Job endured.

145 In addition to headings, some divisions in the text on these pages are marked by a space, as if room had been left for a heading to be added later in red, followed by text beginning with an initial. Proceeding through the folios 96^r–101^r, 101^r–103^v, and 119^r–128^v, one encounters: (a) ten headings and three divisions without headings; (b) the heading on 101^r that names the author; (c) another three headings; (d) space left blank (a page and a half) after a single line of text under the heading ἡ τοῦ μυθικοῦ ὕδατος ποίησις (*Making the*

This suggests that the person who drew up the table of contents thought that no. 48 began at 96^r, dividing the texts as follows: (a) no. 47 on 110^r–111^v; and (b) no. 48 on 96^r–101^r, 101^r–103^v, 119^r–128^v. The result of carving up the texts this way is a first text without subdivisions—presented as a single integral text—followed by a collection of “chapters” or excerpts from the same author. Even if in fact the reality was more complicated, this presentation suggests that the person who drew up the table of contents was disposed to see this manuscript as a collection of both integral texts and excerpts.

This leaves one more item in the table of contents marked as a collection of excerpts: no. 52 (*Other Chapters by Different Makers, On Making Gold*). There is no overall heading for these chapters in the manuscript. Instead, immediately after the preceding text (no. 51, *Alphabetical Lexicon of Gold-Making*), a series

Mythic Water), of which the full page (102^v) was later filled with a labyrinth and verses about the labyrinth; (e) a new division without a heading (but made perceptible by its initial) at the top of 103^r; and (f) thirteen more headings. This amounts to twenty-seven headings and four divisions without headings, or thirty-one divisions in total. It is easy to imagine how the person who drew up the table of contents might have missed the unlabeled division on 103^r (and thus have reported only “thirty chapters”), since it is found at the top of a page and so does not stand out visually by way of a gap in the text like the other divisions without headings.

In the heading *Making the Mythic Water*, “mythic,” i.e., “narrative” or manifest, is presumably contrasted with “mystic,” i.e., secret or hidden in the sense of theoretical. Stephen of Alexandria distinguishes between “mythic” and “mystic” chemistry: “Mythic [chemistry] is confounded by great abundance of words, while mystic [chemistry] deals by reason with creations of the cosmos” (ἡ μὲν μυθικὴ πολυπληθὴς λόγων συγγέεται, ἡ δὲ μυστικὴ λόγῳ δημιουργίας κόσμου μεθοδεύεται); *Letter to Theodore*, M 14^r, ed. Papathanassiou, 167, lines 21–23 = Ideler 208_{29–31}. In my interpretation of these terms, I agree with Viano, “Les alchimistes gréco-alexandrins,” 107. See also pseudo-Democritus, *Physics and Arcana*, §16, M 69^v_{27–28}, ps.-Dem. Martelli Engl., 96, lines 168–70: “for they, thinking that we are giving a mythic but not mystic account” (δοκοῦντες γὰρ ἡμᾶς μυθικὸν ἄλλ’ οὐ μυστικὸν ἀπαγγέλλειν λόγον). Both of these passages are cited by Papathanassiou, *op. cit.*, 86 n. 30. The Syriac translator of pseudo-Democritus seems to have interpreted “mythic” similarly to Stephen of Alexandria, that is, not as “legendary” or “fanciful” but rather as a Platonic “story” or “allegory” meant to prepare the listener to grasp the more difficult or abstract formulation for which it is an allegory; the Syriac translation reads *kad sābrin d-bêt matle w-lā ba-šrārā mmallīn ‘aman*, “since they think that they speak with us in parables (*matle*) not in truth (*šrārā*),” i.e., figuratively, not literally (Martelli proposes emending *mmallīn ‘aman* to the very similar *mmallīnan ‘amāk*, “we speak with you,” so as to accord better with the Greek); ps.-Dem. Martelli Engl., 162, lines 3–4.

of brief passages is arrayed under individual headings, marked in the same color ink (not rubricated). These include descriptions of specific substances and processes, as well as a recipe. They thus give every appearance of being a miscellaneous assemblage of additional excerpts of interest to a reader of this volume, just as their entry in the table of contents suggests.

Finally, as already mentioned, the manuscript ends with Agatharchides on mines. This portion fills six pages and includes two excerpts: (a) “On Minerals in Which There is Gold in Those Places; How It Is Prepared,” Περὶ τῶν μεταλλικῶν λίθων ἐν οἷς ὁ χρυσὸς ἐν ἐκείνοις τοῖς τόποις, ὅπως κατασκευάζεται (138^r₄–140^r₁₂); and (b) “Another [Chapter] on Gold Mines,” ἄλλο περὶ μετάλλω(ν) χρυσοῦ (140^r₁₂–140^v, where the text breaks off). Since the second excerpt breaks off on the last surviving page of the manuscript (reckoning by the original order of quires), it is not clear how much more was originally quoted, or whether it was followed by any further texts or excerpts. The two excerpts correspond to and derive from two nonadjacent Agatharchides excerpts included by Photios in his *Bibliotheca*.¹⁴⁶ As Letrouit points out, the manuscript even includes the words Photios inserts, for example, to indicate that this is a quotation (φησὶ).¹⁴⁷ Nevertheless, the two passages included in M represent a compiler’s selection of two relevant excerpts from a much longer collection of excerpts quoted by Photios. In other words, what we have here is two excerpts from an excerpt-collection.

Logic and Structure of the Collection

The internal logic of M is complex. Its structure is not so obvious and rigid as a manuscript of the *Organon* (with its prescribed order of Aristotelian texts prefaced by Porphyry’s *Eisagōgē*), a collection of Plato’s dialogues (grouped by tetralogies),¹⁴⁸ Constantine VII’s

146 Photios, *Bibliotheca*, codex 250, §22–29, 95–97 (breaking off at γένους 458b1), ed. R. Henry (Paris, 1959–91), 7:151–56, 181–83; see Letrouit, “Chronologie,” 67 n. 234, where “§94, 457b 35” should read “§95, 457b 36.” M’s text of these excerpts appears to be independent of the two manuscripts used by Henry as the basis for his edition; Letrouit, “Chronologie,” 68 n. 235.

147 Letrouit, “Chronologie,” 67.

148 E.g., the well-known ninth-century Plato manuscript Oxford, Bodleian, Clarke 39, which numbers the tetralogies.

Historical Excerpts (organized thematically),¹⁴⁹ or even an anthology of epigrams like the *Palatine Anthology* (arranged for the most part by type of epigram).¹⁵⁰ Instead, M's structure is loose and flexible, with a clear overarching structure but many apparent deviations in the details, including various collections of excerpts juxtaposed with related texts.

Because of this, a full account of the manuscript's structure and the logic of its composition would require a comprehensive analysis of all its texts. This would take far more space than can be allotted to the present article and so must fall outside of its scope. Instead, I will sketch the contours of this structure and its logic in sufficient detail to allow a comparison with other cultural products of its age.

To justify his proposed reconstruction of the manuscript's original configuration, Saffrey offered a brief account of the manuscript's structure. According to him, Stephen of Alexandria's works (nos. 1–10) were a good introduction to the manuscript's subject. The iambic verses (nos. 18–21) that follow after the lacuna (nos. 11–16 and beginning of no. 17) could then have been good for memorization. Then follow sections on Democritus and Zosimos, each with their respective commentators (roughly, nos. 22–28 and nos. 29–41). Finally, the manuscript ends with “technical treatises” (nos. 42–50) and the lexicon of technical terms (no. 51).¹⁵¹ Taking Saffrey's outline as a point of departure, let us take a closer look.

M's most prominent text is the series of nine lectures (plus a “letter”) by Stephen of Alexandria *On the Great and Sacred Art of Making Gold* (nos. 1–10). Although the end of *Lecture 9* is missing, even the surviving portion is formidable, filling thirty-two folios (out of the manuscript's 196 surviving folios), or about sixteen percent of the manuscript.¹⁵² These nine lectures are indeed an excellent introduction to

the theoretical interpretation of material transformations advanced by M. To the modern reader, Stephen of Alexandria can come across as challengingly “rhetorical,” cryptic, and disconnected.¹⁵³ Yet to a learned middle Byzantine reader, Stephen's exposition would, I contend, have been considerably more accessible than metallurgical recipes or rigorous argumentation in support of a physical theory that might explain why they worked. In the manner of an introductory lecture, Stephen draws his reader in with a literary style appealing to Byzantine tastes and a focus on the “big picture,” suggesting links between his theory of chemistry and other mainstream sciences of the day, from medicine and physiology to astrology and cosmology.

Lecture 1 begins with a prayer that transitions into a stylized invocation of a “nature” above all natures.¹⁵⁴ Technical details are alluded to without coming into focus. Rather than being a flaw, Stephen's compositional choice allows this introductory portion to serve as an overture not only to all of Stephen's *Lectures* but also to the entire corpus that follows. With a commentary on the famous alchemical aphorism (“Nature delights nature, and nature masters nature, and nature conquers nature”), the text makes this aphorism a sort of mantra for the compilation.¹⁵⁵ Likewise, Stephen's insistence on the comprehensibility of nature's wonders through philosophy invites the reader to see Stephen's *Lectures* and the following texts through this lens.¹⁵⁶ In the following *Lectures*, Stephen's discussions become at times more specific, referring to particular substances and chemical processes and suggesting how they might work. But the overall approach throughout is not analytical but rather discursive and preliminary, introducing the reader to the concepts and aims of the art with

149 A. Németh, “The Imperial Systematisation of the Past in Constantinople: Constantine VII and His *Historical Excerpts*,” chap. 11 in König and Woolf, *Encyclopaedism*, 232–58, esp. 239.

150 Heidelberg Palat. gr. 23 + Paris suppl. gr. 384 (tenth century). See Cameron, *Greek Anthology*; J.-L. van Dieten, “Zur Herstellung des Codex Palat. gr. 23/Paris suppl. gr. 384,” *BZ* 86–87 (1993–94): 342–62, esp. appendix; Maltomini, “Selezione,” esp. 114–15.

151 Saffrey, “Historique,” 7.

152 If we assume that *Lecture 9* was about the same length as the other lectures, around three to five folios, then only about two folios would be missing from the end of *Lecture 9*.

153 Taylor, “The Alchemical Works . . . Part 1,” 119: “The work of Stephanos has been decried as rhetorical, as a patchwork etc., and the impression is conveyed that he has merely reproduced the work of older authors.” Taylor goes on to contend that even though Stephen did not work in the laboratory and may be unoriginal, his is still one of the earliest full-length treatises on alchemy and may bear witness to earlier sources.

154 I base this and the following summaries of topics covered in Stephen's *Lectures* on the summaries by Papathanassiou in the introduction to her edition of the text (pp. 83–101).

155 On the aphorism, see C. Viano, “Olympiodore l'alchimiste et les présocratiques: Une doxographie de l'unité (*De arte sacra*, §18–27),” in Kahn and Matton, *Alchimie*, 95–150, at 99.

156 Stephen of Alexandria, *Lectures*, ed. Papathanassiou, 83–84 (introduction).

which the rest of the compilation will be concerned. This is done with frequent prayers and invocations of God, references to “ancient philosophers,” and allusions to the deep understanding of natural and divine phenomena to be acquired by studying the art. For the modern historian of science impatient with long-winded speeches, this may seem like a distraction; for the middle Byzantine reader, this familiar mode of discourse pleasantly introduced the subject matter at hand without jumping immediately into technical details, presenting technical terms without strictly defining them yet, and encouraged a reverent attitude toward an art, indeed a science of that art, that was to be the key to a “grand theory of everything.”

At the same time, Stephen’s *Lectures* articulate key themes and questions that the reader would do well to keep in mind. For example, *Lecture 2* instructs the reader to understand chemical processes (especially “making gold”) as a culmination of higher education (he mentions arithmetic, geometry, music, astronomy—i.e., the quadrivium—and human anatomy), not to be confused with mere craftsmanship. The *Letter to Theodore* distinguishes between “mythic” (narrative) versus “mystic” (secret) chymia.¹⁵⁷ *Lecture 4* introduces the concept of a single “nature” that underlies all bodies, a crucial concept for the transmutation of metals, linked by Olympiodoros (no. 33 in *M*) to pre-Socratic philosophers who believed in a single “principle” (*archē*) of all.¹⁵⁸ Stephen returns to this theme in *Lecture 9*, where he asserts that elements change into one another by changing their qualities, not their “natures.” *Lecture 5* asserts correspondences between physics (four elements, four qualities), physiology (four humors), chemistry (four reagents), and astronomy (solstices and equinoxes), and between metals (seven “bodies” or metals) and astrology (seven planets). And so on. The other *Lectures* also have much to say, but what I have mentioned should suffice to underscore Stephen’s concern to stress the “big picture,” avoiding complex argumentation in favor of a survey of the broader significance

of the field. Stephen’s *Lectures*, in other words, seek to explain why someone should be interested in alchemy in the first place.

In beginning a collection on a particular subject with a relatively recent interpreter of the subject like Stephen of Alexandria, *M* resembles manuscripts of the *Organon* (in Greek, Syriac, Arabic, and other languages) that began not with Aristotle but with Porphyry’s *Introduction* (*Eisagōgē*) to Aristotle’s *Categories*, which served as an introduction to the entire *Organon*. *M*’s field is, of course, not logic, and Stephen’s *Lectures* are not concerned with terminological clarity and definitions like Porphyry’s *Eisagōgē*. But both Stephen and Porphyry (whose *Eisagōgē* was indeterminate enough to be itself the object of numerous commentaries) offer an open-ended introduction to the subsequent corpus.¹⁵⁹

Turning now to the corpus that follows Stephen’s *Lectures*, we are faced with the works attributed to the emperors Heraclius and Justinian but falling within a lacuna (nos. 11–15). Because these texts are missing, we can only guess what role they played within the collection, based on their titles and ascriptions. Stephen’s final *Lecture* (no. 10), with its subtitle indicating that it was addressed to Heraclius, suggests a smooth transition to Heraclius’s *On Chemistry* (*Peri chimēs*, no. 11), addressed to Patriarch (*hierarchēs*) Modestos of Jerusalem (*tēs Hagias Poleōs*). The title is not enough to conclude whether it was a general introduction continuing in the same vein, a more detailed theoretical discussion, or a recipe. Next come Heraclius’s *Thirty-Five Chapters on Making Gold* (no. 12), clearly a collection of excerpts, followed by a “meeting” or “assembly” (*syllogos*) convoked by Heraclius (no. 13), perhaps a dialogue. A letter (no. 14) and chapters (no. 15) are also ascribed to Justinian.¹⁶⁰ Taken together, these imperial works probably continued the reader’s initiation into the subject matter with focused discussion and excerpts on what exactly the art of arts entailed. The likelihood

157 See n. 145.

158 Viano, “Olympiodore l’alchimiste et les présocratiques,” esp. 126–34. See also C. Viano, “Aristote et l’alchimie grecque: La transmutation et le modèle aristotélicien entre théorie et pratique,” *Revue d’histoire des sciences* 49.2–3 (1996): 189–213; C. Viano, “Une substance, deux natures: Les alchimistes grecs et le principe de la transmutation,” in *Dualismes: Doctrines religieuses et traditions philosophiques*, ed. F. Jourdan and A. Vasiliu (Iași, 2015), 309–25.

159 In commentary traditions, this indeterminacy is often desirable because it opens the way for future super-commentaries by students and teachers. See A. Q. Ahmed, “Post-Classical Philosophical Commentaries/Glosses: Innovation in the Margins,” *Oriens* 41 (2013): 317–48.

160 Reitzenstein, presumably thinking of Justinian’s profile as a legislator, suggested that his letter was a “decree” declaring “the permissibility” of performing and writing about alchemy: “Zur Geschichte der Alchemie und des Mystizismus,” *NachrGött*, 1919, 1–37, at 7.

that recipes were included is increased by comparison to the text copied by a fifteenth-century scribe onto what is now M's first folio: the text is a recipe whose last line ascribes it to Justinian.¹⁶¹

Two texts associated with Cleopatra follow: Komerios's *Discourse to Cleopatra* (no. 16) and the *Dialogue of Philosophers and Cleopatra* (no. 17). The beginning of this pair of texts is lost in the same lacuna, but four folios survive. The manuscript does not indicate that a new text begins anywhere within those four folios, suggesting that all that survives is the end of the second text (no. 17). On the other hand, these four extant folios may in fact contain the end of the first (no. 16) followed by the second (no. 17) in its entirety, except that the transition between the two texts has been lost in transmission (that is, before or at the time M was copied).¹⁶² For our present purposes, it suffices to characterize the text of Komerios (or Komarios)

and Cleopatra edited by Berthelot and Ruelle from a different manuscript, where it is entitled *By Komarios the Philosopher and Archpriest Teaching Cleopatra the Divine and Sacred Art of the Stone of Philosophy*.¹⁶³ The portion not extant in M (§1–6) begins with a prayer to Jesus Christ (§1).¹⁶⁴ It then announces the beginning of a book recounting a conversation between “Komarios the Philosopher and Cleopatra the Sage (*sophē*)” (§2) and narrates that Komarios taught her “secret (*mystikē*) philosophy,” seated on his throne, by speaking about the all-encompassing monad and the four elements (§3). Komarios pronounces his teaching, giving very general instructions to gather certain minerals in order to dye metals however she likes (§4).¹⁶⁵ The text then

161 *CAAG*, pt. 2, no. 4bis, Appendix 1; cited by Letrouit, “Chronologie,” 57 (§10). The text ends with ἐπλήρωθη σὺν θεῷ χρίσης ἰου[στί]νιανού, i.e., ἐπλήρωθη σὺν θεῷ χρίσις Ἰουστινιανού, “the end, with God’s help, of Justinian’s Coloring.” Berthelot and Ruelle print χρίσις (*CAAG*, 2:10520) but translate “la pratique” (ibid., 3:114), with χρήσις in mind. According to their apparatus, M’s reading is Ἰουστιανού, but based on a photograph of the page, I read ἰου[στί]νιανού, where the part in brackets corresponds to a crease in the parchment. This (in particular the first *nu*) makes Berthelot and Ruelle’s reading impossible. The letters in the crease are difficult to read but could plausibly be a ligature of στ, with a mark or marks above that might be a *diaresis* (indicating *iota*). The text itself appears to be a heavily reworked (and shorter) adaptation of a text preserved in A, fols. 240^v–242^r, ed. *CAAG*, 2:384–87 = pt. 5, no. 24. It ends with the same line: ἐπλήρωθη ἡ χρήσις Ἰουστιανού βασιλέως (A 242^r). (The manuscript does not give this text a title; Berthelot and Ruelle drew the title from this last line.) Another text reporting “Justinian’s” teachings is about the alchemical “egg”; see *CAAG*, 1:215.

162 The text in M beginning at 40^r_{25–26} (καὶ ὑμεῖς ὦ φίλοι) corresponds to part of a text preserved in A 74^r–79^v (and also in L), printed as *CAAG*, pt. 4, no. 20 (Berthelot’s edition is missing the last line ἐνταῦθα γὰρ ἡ τῆς φιλοσοφίας τέχνη [A: τῆς φιλοσοφίας ἡ τέχνη M] πεπλήρωται). See also the partial edition and translation given by O. Lagercrantz, “Ueber das Verhältniss des Codex Parisinus 2327 (= A) zum Codex Marcianus 299 (= M)” [Part 2], in Bidez, *CMAG*, 4:400–403, followed by commentary (404–23). Using Berthelot and Ruelle’s section numbering of A’s text, M contains §7–17. Papathanassiou prints M 40^r_{1–25} as an appendix to her edition of Stephen’s *Lectures*, as well as the related passage in A 73^v_{6–74^r₁₃} (M 40^r_{1–25} seems to be an abridged version of A 73^v₅ ἐκάλεσαν καὶ ἀλήθειαν εἶπον το 74^r₅ καὶ ἐν τῇ ἰδίᾳ δόξῃ, ed. Papathanassiou, 222–23, lines 23–49; the text in A ends a few lines later), where it is represented as the rest of Stephen’s *Lecture 9*. But this could also be the

end of text no. 16, which A (or the textual tradition it represents) has incorporated into the text of Stephen’s *Lecture 9*.

Only once critical editions of the texts in question have been produced will we have hope of solving these puzzles. Still, it may be useful, given the confusion surrounding this portion of the manuscript, to spell out the correspondences between A and M. A agrees with M in what it represents as Stephen’s *Lecture 9* up to A 73^r₆ οὐκ ἄρα ἰὸς νοερός, καὶ φησὶν [*sic*] = M 39^v_{28–29} (i.e., almost to the end of M’s quire with only ἐν τοῖς ζωμοῖς [*sic*], μετὰ τὸ εἶα κάτω καὶ γε- remaining). Then A jumps to a different source, interpolating A 73^r_{6–73^v₄} ὁ μέγας Ὀλυμπιόδωρος up to χρυσοῦν λέγεται. A then seems to pick up again with M’s μετὰ τὸ εἶα κάτω καὶ γε-, finishes the word: -νήσεται, and jumps to the next surviving folio of M: -λεσαν . . ., supplying the beginning of the word: ἐκάλεσαν (A 73^v₅). A continues down to M 40^r₂₅ ἐν τῇ ἰδίᾳ δόξῃ and adds a final line that amounts to variations on δόξῃ (A 74^r_{9–13}). Then A draws on another source to give no. 16, of which M then continues from §7.

163 Κομαρίου φιλοσόφου ἀρχιερέως διδάσκον [*sic*] τὴν Κλεοπάτραν τὴν θείαν καὶ ἱερὰν τέχνην τοῦ λίθου τῆς φιλοσοφίας, A 74^r–79^v; see n. 162. For the participle διδάσκον, see Lagercrantz, “Verhältnis” [Part 2], 404.

164 There is no reason to follow Berthelot in seeing this prayer as the interpolation of a later “monk” (*CAAG*, 3:278 n. 2), unless one is committed to seeing this text as an ancient, pre-Christian text (even then, of course, whether the adapter was a monk or not is beside the point). Hints of Christianity are scattered throughout the text. Reitzenstein proposed excising §17 of the text in part because it includes a relatively clear Christian reference (μακαρία γὰρ ὑπάρχει ἡ σὲ βαστάσασα κοιλία, cf. Luke 11:27); Reitzenstein, “Zur Geschichte,” 20. But talk of “divine activity” (τὸ μυστήριον . . . θεῖον ἔχον εἶδος, θείαν καὶ τὴν ἐνέργειαν) could also be evidence of a Christian hand, writing after the articulation of opposing Monenergist and Dyoenergist Christologies around the sixth and seventh centuries, on which see J. Tannous, “In Search of Monotheletism,” *DOP* 68 (2015): 29–67. Those who see an authentic ancient core to this text might reply that such Christian references are due to a later redactor.

165 Literally, Komarios tells her that she will have “a whole dyer’s workshop” (πᾶν βαφεῖον).

narrates that Cleopatra received this “text” (γραφέν) from Komarios and went on to consider the division of philosophy into four parts, four stages in the alchemical process (§§5–6).

At the point where **M** picks up the text (§7), the text addresses multiple listeners directly (ὦ φίλοι) and asks them to consider how plants of different sorts grow in all sorts of different habitats, from which they must be gathered, and how air and “divine water” nourish them. This seems to be meant as an analogy for an alchemical process.

At this point Ostanēs and others speak to Cleopatra (§8).¹⁶⁶ Clearly we must now be within text no. 17, the *Dialogue of Philosophers and Cleopatra*. They ask her about the elements’ ascent and descent, etc.—again, speaking in general, non-specific terms about alchemy. She replies (§9). The dialogue continues, mostly in these general, allegorical terms, though arsenic and other chemicals and ore are mentioned (§11). Among the topics discussed is the interrelation of the four elements (§16). Cleopatra concludes by saying she learned all this from Komarios; the philosophers are delighted with her and continue asking questions (§17).¹⁶⁷ This leads to Cleopatra’s final synthetic statement, cosmological and theoretical while at the same time weaving in alchemical operations (§17, end). The text clearly intends to be mysterious: Cleopatra says that she will “begin by speaking in riddles” (§11) and at one point declares, “Behold the mystery of the philosophers, which our fathers swore to you neither to reveal nor to publish!” (§14).¹⁶⁸

Thus, in spite of the complexity of the philological, codicological, and textual-critical problems that remain with this pair of texts involving Cleopatra, we can discern that they, like Stephen’s *Lectures* and probably like the intervening works of Heraclius and Justinian, were general and introductory in character. They neither offer detailed analysis of the concepts and

operations they discuss nor require their reader to follow any technical details. Instead, they invite the reader to imagine a celebrated personage speaking about a tantalizingly powerful art, an enticingly universal natural science that seems to hold the key to all knowledge.

So far **M** has offered a series of introductory texts. Indeed, in 1919 Reitzenstein hypothesized that the compiler drew from three different compilations, from the ages of Cleopatra, Justinian, and Heraclius respectively, and began his own compilation with the introductory material from each, in reverse chronological order; Reitzenstein associated Stephen of Alexandria with Heraclius’s compilation. As a parallel, Reitzenstein adduced the epigram anthology of Kephala, which also begins with the successive introductions of three older compilations on which it draws.¹⁶⁹ Even if we are not inclined to accept Reitzenstein’s hypothesis, **M**’s beginning certainly gathers together a series of introductory texts, quite possibly from multiple earlier compilations, reminiscent of Kephala’s choice to start off his compilation with several older introductions.

M’s next section contains four iambic poems.¹⁷⁰ Their length is not insubstantial: 268, 265, 229, and 332 lines, respectively (a total of 1,094 lines). Although shared idiosyncrasies in style, vocabulary, and meter have led modern scholars to view all four poems as the work of a single (early medieval) author,¹⁷¹ **M** ascribes them to four different authors: Heliodoros, Theophrastos, Hierotheos, and Archelaos. Based on verbal parallels, it has been argued that they draw on Stephen’s *Lectures*.¹⁷² Just as Stephen’s *Lectures* have been scorned, so too have these verses been regarded as poor poetry.¹⁷³ Perhaps it is more appropriate to view them as didactic verse that was not intended as high literature.¹⁷⁴

166 For an English translation of §§8–17 up to “Blessed is the womb that bore you,” see Browne, “Rhetorical” [Part 2], 22–24.

167 Reitzenstein hypothesized that her reference to Komarios at the beginning of §17 was originally the end of the text and that the rest was added later; Reitzenstein, “Zur Geschichte,” 13.

168 Trans. Browne, “Rhetorical” [Part 2], 22, 23; ed. *CAAG*, 2:294, 296: ἐν αἰνίγμασι δὲ ἄρξομαι τοῦ λέγειν, and Ἴδου τὸ μυστήριον τῶν φιλοσόφων, καὶ περὶ αὐτοῦ ἐξώρκισαν ὑμῖν οἱ πατέρες ἡμῶν τοῦ μὴ ἀποκαλύψαι αὐτὸ καὶ δημοσιεῦσαι (or perhaps “our fathers made us swear not to,” reading ἡμῖν or ἡμᾶς for ὑμῖν).

169 Reitzenstein, “Zur Geschichte,” 3–4, 6.

170 All four were edited under the name of Heliodoros by Günther Goldschmidt; nos. 19 (Theophrastos) and 21 (Archelaos) were translated by C. A. Browne. See n. 18 above.

171 Browne, “Rhetorical” [Part 2], 15–17.

172 Goldschmidt, 19, 24–25; Browne, “Rhetorical” [Part 2], 16–17.

173 Browne, “Rhetorical” [Part 1], 131: “it was Heliodoros, the conjectured poetic imitator of Stephanos, who first paraphrased his turbid sentences in wretched iambic meter.”

174 Cf. Psellos’s didactic verses, e.g., on grammar, rhetoric, law, and medicine: *Poemata*, nos. 6–9, ed. L. Westerink (Stuttgart and Leipzig, 1992). Didactic poetry was a standard Greek genre, not only in medieval Byzantium (*ODB*, s.v. “Poetry,” p. 1689) but also in

While varying in their details, the four poems follow the same overall structure. Each begins by exhorting listeners to attend to its subject matter for their own benefit. At the core of each is a description of alchemical procedures, framed in varying degrees of allegory. Each ends with an invocation of the Christian God. The first (Heliodoros) is addressed to an emperor.¹⁷⁵ The third (Hierotheos) addresses an unknown reader: “whoever you are, friend.”¹⁷⁶ All four continue the compilation’s gradual introduction to the subject matter, this time in a particularly accessible verse form, pleasantly varied, which could be studied with a teacher who might explain the procedures being described at each step.

Continuing with a comparable analysis for the rest of the manuscript would require a detailed examination of texts that have not yet been studied in sufficient depth. Nevertheless, we can sketch a rough outline of the rest. At this point, the manuscript contains two large clusters: one cluster of texts ascribed to Democritus, commenting on them, or otherwise related to them (nos. 22–28, or fols. 62^v–92^v, about thirty-one folios) and another, longer cluster revolving around Zosimos of Panopolis and his commentators (nos. 29–41, or fols. 92^v–95^v, followed by a lacuna, then jumping to fols. 141^r–196^v, then jumping to fols. 112^r–118^r—more than sixty-five folios). It is clear from editions of pseudo-Democritus and Zosimos that even the apparently integral texts that appear under their names are actually excerpts from and adaptations of older books.¹⁷⁷ Other texts in these clusters too are a mix of recipes, narrative, and theoretical explanation, much like the texts of pseudo-Democritus and Zosimos themselves. The manuscript compilation then includes a series of short “technical treatises,” as Saffrey called them (nos. 42–46, 49–50), distributed around

the lengthier and more theoretical and exegetical discussion of the Christian (nos. 47–48, or fols. 110^r–111^v, 96^r–103^v, 119^r–128^v, about twenty folios). The Christian’s works may have been intended as a sort of commentary on Zosimos, as Saffrey suggests,¹⁷⁸ but they are positioned as freestanding theoretical works in the midst of, and perhaps explaining, recipes and other short technical texts.

The manuscript ends with a lexicon of alchemical terminology (no. 51), a final set of excerpts (no. 52), and the two excerpts from Agatharchides on gold mines not mentioned in the table of contents. As Letrouit points out, however, these excerpts from Agatharchides appear immediately after the previous excerpt-collection (no. 52) and could be construed as part of it.¹⁷⁹ The headings are certainly formatted in such a way as to suggest that this may even have been the scribe’s original intention, so that they should probably be seen as part of the compilation described in M’s table of contents.

Even the alchemical lexicon (no. 51), like any lexicon, can be seen as a sort of excerpt-collection, a collection of brief, heavily adapted excerpts (perhaps better referred to as definitions extracted and synthesized from other texts). As Martelli has shown, some of the definitions derive from extant Greek alchemical texts, and at least one can be traced to an alchemical work by Zosimos that does not survive in Greek but is extant in Syriac.¹⁸⁰

From all this we conclude that the manuscript has few fully integral texts outside of the introductory portion. Most of it is an artful assemblage of digested, distilled, excerpted, and epitomized texts—recipes, narrative, and theory—arranged in a loose structure that weaves together these different types of texts, both within titles and across the compilation as a whole.

antiquity (e.g., Hesiod, Empedocles, Aratus; see A. Lesky, *A History of Greek Literature*, trans. J. Willis and C. de Heer [New York, 1966], 100, 214; Aratus, *Phaenomena*, ed. and trans. D. Kidd [Cambridge, 1997], 8).

175 Σὺ οὖν ἄναξ (line 32). The title of the poem (M 43^v) says that it is addressed to an Emperor Theodosios.

176 ὅστις εἶ, φίλε (line 21).

177 Ps.-Dem. Martelli Engl., introduction; *Les alch. gr. 4.1* Mertens, ci: “À partir des opuscules subsistants [in the manuscripts, above all in M] et des divers témoignages . . . il est extrêmement difficile de se représenter l’œuvre de Zosime dans son ensemble. On a en effet l’impression de se trouver devant une série incomplète de pièces de puzzle dont on ignore même si elles proviennent d’un seul jeu.”

178 Saffrey, “Historique,” 7.

179 Letrouit, “Chronologie,” 66–68. This would seem to render unnecessary Saffrey’s hypothesis (“Historique,” 6–7) that M is a copy of a preexisting compilation that had almost identical contents, missing only the excerpts from Agatharchides at the end, and that M’s scribe did not produce the table of contents based on the manuscript but copied it straight from this hypothesized antigraph.

180 M. Martelli and S. Valente, “Per una nuova edizione commentata di un lessico alchemico bizantino,” *Eikasmos* 24 (2013): 288–94 (§4, by Martelli). The lexicographer has brought these definitions into the standardized syntax of a lexicon, as discussed by Valente (ibid., 286–88 = §3).

The compilation would thus best be characterized as a hybrid between a text-collection and an excerpt-collection. The compilation's long introductory portion is where the most integral texts are found, especially Stephen of Alexandria's *Lectures* and the iambic poems, but possibly also the texts lost in the lacuna between them, including the Cleopatra texts intervening between the imperial authors (Heraclius and Justinian) and the iambs. Less integral but still lengthy portions of texts appear in the clusters around pseudo-Democritus and Zosimos. At the same time, the postintroductory portion of the compilation following the iambic poems (and possibly some of the imperial portion ascribed to Heraclius and Justinian as well) is home to a host of much shorter excerpts varying in length from a few pages to a few lines.

3. Conclusion: Middle Byzantine Book Culture

In discussing the state of preservation of texts in the Greek alchemical corpus, Mertens suggests that the alchemical collections in extant manuscripts, including *M*, were

connected with the wide current of encyclopaedic interest which marked the ninth and tenth centuries in Byzantium and resulted in the constitution of innumerable other corpora of the same type: excerpts compiled on the order of Constantine Porphyrogenetos, the *Geoponika*, the Hippocratic Corpus, the *Hippiatrica*, [the] collection of the Greek tacticians, the Hermetic Corpus, and many others, including the *Palatine Anthology*.¹⁸¹

Having examined *M* as a collection, how should we evaluate this suggestion and position the manuscript within Byzantine book culture? In the general sense that they are all collections (of texts or excerpts or both), *M* certainly fits right in. Given the prominence of florilegic culture in Byzantium from late antiquity onward, however, this is not too surprising. When it comes to specifics, *M*, as we have seen, is somewhat different from the best-known ninth- and tenth-century collections dubbed “encyclopedias” (in an extended sense)

by Lemerle. It is not nearly as systematic in its organization or compilation method as Constantine VII's fifty-three-volume *Historical Excerpts* (produced by gathering a library of original historical works, choosing fifty-three thematic categories into which to fit excerpts, and excerpting and rearranging accordingly),¹⁸² or the *Palatine Anthology*.

Likewise, *M*'s structure is not nearly as rigid as that of another technical compilation, the *Geoponika*.¹⁸³ This agricultural compilation is neatly organized, with a proem that spells out the excerpt-collection's purpose and sources, followed by the compilation's twenty books, each with its own brief preface describing the subject of that book, a list of the book's chapters, then the chapters themselves, each labeled and ascribed to one of the compilation's sources. We may further note that while both may generally be called technical compilations, the *Geoponika* is much more focused on *technē*, the art of agriculture (even though it also advertises *epistēmē*, theoretical knowledge, in the proem).¹⁸⁴ Like *M*, it includes recipes, such as the

182 Németh, “Imperial Systematisation.” In light of Németh's remarks about the numerological, mathematical, and ideological significance of the number fifty-three (ibid., 245–47), it is intriguing that *M*'s table of contents is just one short of that number, and that item no. 18 is formatted as if it were two items (see n. 128 above). Still, if the number of items was somehow meant to be significant, one would expect the scribe to have numbered them.

183 H. Beckh, ed., *Geoponica sive Cassiani Bassi scholastici De re rustica eclogae* (Leipzig, 1895); trans. A. Dalby, *Geoponika: Farm Work. A Modern Translation of the Roman and Byzantine Farming Handbook* (Tornes, Devon, 2011). For discussion, see Lemerle, *Premier*, 288–92, who hypothesizes, based on a comparison with Photios, *Bibliotheca*, codex 163, that the *Geoponika* is based on a compilation by one Ouindanos Anatolios of Beirut (cited by Photios), along with material excerpted from eight other authors (including Varro). Furthermore, Lemerle (*Premier*, 290–91) discusses the manuscript evidence (and some of the problems with the hypothesis) that Kassianos Bassos *scholastikos* was responsible for some or all of the compilation, including the very first heading that names him and headings addressed to his son Bassos. See also A. A. Carrara, “Geoponica and Nabatean Agriculture: A New Approach into Their Sources and Authorship,” *Arabic Sciences and Philosophy* 16.1 (2006): 103–32; and, especially for the relevance of Arabic versions of the *Geoponika* and its late antique predecessors for reconstructing the Greek tradition, C. Scardino, “Editing the *Geoponica*: The Arabic Evidence and Its Importance,” *GRBS* 58.1 (2018): 102–25, who suggests (p. 108), based on comparison with the Arabic, that the authorial attributions in the headings are not original to the excerpts and often misrepresent them, as argued by Eugen Oder in 1890.

184 *Geoponika*, proem.5 (ed. Beckh, 2, line 4).

181 Mertens, “Graeco-Egyptian Alchemy,” 222–23.

final chapter's recipe for fish sauce (*garum*),¹⁸⁵ but the primary purpose of their inclusion in the *Geoponika* is not as the basis for theoretical discussion about why they work but to facilitate the production of various foods and medicines. Set in relief with the *Geoponika*, *M* appears all the less practical, even in its recipes; it is in the first place about interpreting, not carrying out, chemical experiments.

The looseness of *M*'s structure perhaps finds a parallel in the *Hippiatrika*.¹⁸⁶ As Anne McCabe describes, this compilation excerpts from a range of genres and literary styles, from prosaic recipes to formal medical prose.¹⁸⁷ In its loose structure, *M* bears most resemblance to the "M recension" contained in a late-tenth-century or eleventh-century manuscript in Paris.¹⁸⁸ That manuscript of the *Hippiatrika* does not organize its excerpts into separate books but lists them all in the table of contents, numbered consecutively from 1 to 1,223, followed by an unnumbered section on weights and measures used in horse medicine.¹⁸⁹ This is in contrast to the "B recension," which is organized under 130 different thematic headings,¹⁹⁰ more like the extant Greek *Geoponika*. McCabe argues that the M recension has structural affinity to catenae in that it is an excerpt-collection that juxtaposes various opinions on a given subject, thus facilitating their comparison (*synkrisis*).¹⁹¹ This too may be part of what the alchemical codex *M* was meant to do: rather than follow a strict text-and-commentary arrangement, the compilation returns to similar ideas again and again as articulated by a series of authors. This is not systematic, nor does the compilation's structure highlight this comparison (especially since its texts and excerpts are much longer and fewer than those of the *Hippiatrika*), but an appreciation for *synkrisis* may help explain, for example, the recurrence of the same themes throughout the introductory

portion of the manuscript that we saw in §2. As for subject matter and scope, like the *Geoponika* the *Hippiatrika* is more practical, more focused on *technē* than *M*.

M's contents and structure, especially the introductory portion of integral theoretical texts, but also throughout, betray a grand, universal ambition. It shares this with the *Historical Excerpts* and other ethical and political works associated with Constantine VII, which mobilized whole literary traditions to project order, stability, and an authority with universal pretensions;¹⁹² and, we might add, with the legal codifications of Theodosios, Justinian, and the *Basilika*. Returning to my definition of "encyclopedic," we may observe that these Constantinian texts share this grand, universalizing ambition and synoptic approach to knowledge more with *M* than with the *Geoponika* or *Hippiatrika*. Those technical treatises are systematic and synoptic within their own circumscribed fields, but *M* has much more ambitious claims for the relevance of the specific subset of knowledge-of-particulars that it assembles. By foregrounding Stephen of Alexandria's vision of alchemy's central place in human knowledge about the universe and humanity itself, *M* embodies the encyclopedic, universalizing spirit that has been detected in other florilegia of its era. Perhaps it is in this way closest to the Hermetic Corpus, which seems already to have existed in the eleventh century though our manuscript evidence is later:¹⁹³ a circumscribed body of knowledge meant to be understood by its readers as the key to all knowledge and to true comprehension of reality.¹⁹⁴ That universalizing spirit was not new, of course, as the texts of *M* themselves attest. But perhaps its embodiment in lavish florilegia like *M* was a hallmark of the middle Byzantine book culture of which it was a part.

There is a constant interplay in *M* between crafts like metallurgy and dyeing and the transcendent significance of philosophical interpretations of these crafts' recipes. This back and forth between mundane practice and cosmic significance is part of what has frustrated historians of science, who have wished to

185 *Geoponika* 20.46 (ed. Beckh, 528–29).

186 See A. McCabe, *A Byzantine Encyclopaedia of Horse Medicine: The Sources, Compilation, and Transmission of the Hippiatrika* (Oxford, 2007).

187 *Ibid.*, 14.

188 Paris gr. 2322; see McCabe, *Horse Medicine*, 19–23.

189 The table of contents (now somewhat jumbled) ends on Paris gr. 2322, fol. 14^v, with ,ασκγ' followed by the unnumbered περι μέτρων και σταθμῶν ἵπποιατρικῶν.

190 McCabe, *Horse Medicine*, 26–27.

191 *Ibid.*, 59–65, with further references on *synkrisis*, commentaries, and catenae.

192 Holmes, "Byzantine Political Culture," 60, 64; Magdalino, "Orthodoxy and History," 147; Németh, "Imperial Systematisation," 258.

193 See Mertens, "Graeco-Egyptian Alchemy," 223 n. 50.

194 G. Fowden, *The Egyptian Hermes: A Historical Approach to the Late Pagan Mind* (Princeton, NJ, 1993).

separate the kernels of experimental chemistry in these texts from the chaff of another era's chemical theory. The difficulty of performing this modern hermeneutical surgery shows what *M* was not: it was never meant to offer the raw data of chemical procedures and their outcomes free from theoretical interpretation. Instead, it used those raw data in the service of a grand theory of chemistry and, indeed, of the whole material universe. Sometimes this subordination is implicit, by juxtaposition and arrangement, while other times it is explicit, as when one author after another offers interpretations of specific chemical procedures. By contrast, the famous papyrus of Leiden offered a historian of science like Berthelot precisely what he was looking for: straightforward accounts of chemical procedures, ostensibly unencumbered and unfiltered by premodern authors' critical interpretation.

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There is still much in *M* for the historian who wishes to work out what chemical procedures were available to Byzantine readers. But the real harvest that awaits us in this manuscript is, I would suggest, the theoretical framework within which a Byzantine—both in the middle Byzantine period when it was compiled and in subsequent centuries when readers annotated its flyleaves and margins—would have understood these chemical procedures. This is what the manuscript was meant to convey.

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